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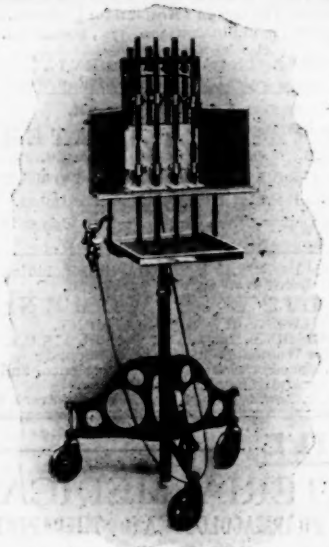

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ON

PYELITIS AND PYELONEPHRITIS.

Delivered before the Royal College of Physicians of London on Nov. 1st, 1928,

BY ALEXANDER GEORGE GIBSON, D.M. OXF.,

FELLOW OF THE COLLEGE; PHYSICIAN TO THE RADCLIFFE INFIRMARY; AND READER IN MORBID ANATOMY IN THE UNIVERSITY OF OXFORD.

THE purulent and semipurulent infections of the kidney are met with in many departments of medical work; they are frequent in general practice; they complicate pregnancy and delay recovery from surgical operations. They are disorders treated by specialists and general practitioners alike. But there is considerable divergence in views on the anatomical lesions which correspond to our clinical types of disease, and until the pathological basis of these infections of the kidney is settled treatment may be imperfect. It is my purpose to attempt to bring some sort of order out of what appears to be discordant. It will be necessary first to review the experimental evidence of the behaviour of the kidney to infecting agents, and later to see how far these views can be borne out by evidence from human disease.

BEHAVIOUR OF THE KIDNEY TO INFECTIONS IN BLOOD STREAM.

There is a long series of papers by various writers which demonstrate clearly that pathogenic organisms of various types can pass through the kidney, experimentally, without any damage or with but microscopic damage to the kidney substance. This has been proved for *B. typhosus*, for *B. coli*,[1] for *Staphylococcus aureus*,[2] for *B. tuberculosis*,[3] for mould spores,[4] and for *B. lepræ*,[5] to mention but a few of the organisms with which experiments have been made. The experiments of Thiele and Embleton [6] demonstrate that organisms are excreted within half an hour of being injected into a serous cavity such as the peritoneum; inert substances such as carmine appears within ten minutes. The presence, therefore, of even a virulent organism in the blood has no certain power of infecting the kidney. In the experiments of Helmholz and Beeler [7] [8] only out of 66 animals whose blood stream was directly injected with the *Bacillus coli* from human cases of pyelitis showed lesions of the kidney; when the pneumococcus was mixed with *B. coli* lesions of the kidney were seen in 4 out of 11 animals injected. Moreover, when the *B. coli* was isolated from a catheterised specimen of urine from an animal under a similar experiment, 22 out of 32 animals injected intravenously showed kidney lesions. Passage therefore augments virulence. Helmholz, Millikin, and Field,[8] however, in a later paper suggest that "the normal renal filter does not permit bacteria injected intravenously to pass through into the urine until local changes are produced." If this means that a microscopic breach in a cellular membrane is necessary for this passage, it may be true, but to assert that there is gross damage, such as might ultimately interfere with kidney function, is at variance with many facts of clinical medicine and pathological anatomy. Examples of this are common, virulent puerperal infections occur with positive blood and urine cultures without more gross kidney damage than cloudy swelling. Typhoid bacilluria does not invariably produce kidney damage. Streptococci of various types and *B. coli* may be found in catheter specimens of the urine of normal persons in amounts that could not be due to contaminations. Thiele and Embleton's [9] experiments in 1913 prove that the route taken by organisms injected into the peritoneum is by the thoracic duct into the blood stream and thence to the kidney.

In a series of experiments by Bumpus and Meisser [10] it was shown that cultures of green-producing streptococci (*S. viridans*) obtained from the devitalised teeth or tonsils of patients suffering from pyelitis, when injected into the veins of rabbits, produced kidney lesions in 76 per cent., a higher percentage than affections of any other organ. Similar experiments with *B. coli* isolated from the urine of patients with pyelitis have been uniformly unsuccessful, and the authors conclude that this organism is of secondary importance compared with the streptococcus. They found that the affinity of an organism which had already infected the kidney was specific, for while 22 of the 32 animals under experiment had lesions of the kidney, only three had lesions of other organs—namely, of the peritoneum, epididymis, and cæcum. Lepper [11] obtained microscopic lesions of the kidney from intravenous injections of *B. coli* in four out of five cases, the inflammatory changes being confined almost entirely to the papilla of the kidney. This author confirmed what had already been proved, that interference with the passage of urine into the bladder by tying the ureter greatly increases the chance of infecting the kidney by intravenous injections of *B. coli*.

In Helmholz and Beeler's [7] series of 32 animals injected intravenously with *B. coli*, 16 showed pyelitis; in ten of these there were also kidney abscesses. In a subsequent paper Helmholz [12] reported a series of ten experiments on rabbits in which the kidneys were infected by the intravenous route; they comprised six cortical abscesses, three medullary abscesses, six cortical and medullary abscesses, and four leucocytic accumulations in the capillaries of the papilla, mainly therefore infections of the kidney substance.

Schmidt and Aschoff [13] require for the proof of a blood infection the presence of a clear focus of infection or source from which such infection could have come. Clinical experience, however, can provide numerous instances in which some trivial infection is followed by pyuria without the slightest evidence of disease or irritation of the lower urinary channels. They assert that even the triangular so-called septic infarct is not due to a blood infection, that it does not lie in connexion with a section of the vascular system of the kidney, but is related to one group of collecting tubules.

BEHAVIOUR OF THE KIDNEY TO INFECTIONS REACHING IT FROM BELOW.

In the matter of experimental ascending infection of the urinary tract there is some disagreement, and from an enormous literature it is possible only to quote the most significant. In 1917 Helmholz and Beeler [7] reported that pyelitis was found in 9 out of 15 animals which had received injections of *B. coli* into the bladder. Helmholz [7] analysed the lesions of 13 kidneys from animals which had been similarly infected; 12 had pyelitis (pelvic inflammation); 6 had diffuse inflammation of the papilla such as is more frequently seen in hæmatogenous infections; 1 had a group of cortical abscesses, and in another the collecting tubules were filled with pus. On the other hand, Dyke and Maybury [14] found that injections into the bladder of an emulsion of *Staphylococcus aureus* or carmine granules failed to ascend the ureter, that ureteral injection reached the kidney pelvis, but that injection of the kidney pelvis did not ascend the renal tubules. Magoun [15] reported that organisms introduced under pressure into the ureter could be found in the cortex of the kidney and in the blood stream. This agrees with the experiments of Mr. Frank Kidd on excised and post-mortem human kidneys; that argyrol introduced under pressure into the pelvis may reach the cortex. Thiele and Embleton [6] found that the application of *Bacillus mycoides* to the anterior urethra of guinea-pigs caused a rapid spread along uninjured lymphatics to the capsule of the kidney, to the retroperitoneal lymph glands, and via the thoracic duct to the blood stream. A similar though less rapid spread occurred when an

emulsion of the same organism was applied to the glans penis. These experiments are held to explain catheter fever. Infection of the genital tract, however, was a matter of great difficulty both in the male and in the female.

Though these experiments demonstrate certain possible sources of infection of the kidney they cannot be directly applied to man, as we shall see later in examining post-mortem results. These experiments, moreover, were concerned with organisms (*B. mycoides*, *B. pyocyaneus*, and *Sarcina lutea*) which are non-pathogenic to the guinea-pig and therefore do not give rise to any inflammatory or self-limiting process of disease. They correspond to the extremely rapid spread from the urethra to the blood stream in virulent cases of gonorrhœa if the resistance to infection is much lowered.

Schmidt and Aschoff published their important monograph [13] in 1893. In a series of rabbits they injected coliform and other organisms into one ureter after ligature; they found without exception scattered purulent foci in both cortex and medulla, well marked at the end of seven days. Both from the general situation of the lesions in relation to the infected pelvis and from the histological appearances they were in no doubt that the lesions were of the ascending type. They made a distinction between ascending and descending infections in the purulent infiltration of the renal tubules and the absence in ascending pyelonephritis of interstitial tissue changes. It is to be doubted whether any merely histological appearances in the tubules can reveal the path of infection, for they may be due to infection creeping up the tubules or, if the infection has been present some days, to the drainage of infecting material downwards from a cortical or blood infection. Lévy-Solal and Misrachi [17] injected *B. coli* into the ureters of rabbits and found that the heart blood was infected soon after, so that a local lesion of the kidney after an ascending infection may be the result of a secondary blood infection. This may explain Schmidt and Aschoff's results. Sweet and Stewart [18] confirm the results of Thiele and Embleton that the spread of an ascending infection is along the ureteral lymphatics. Contrasting with the tissue change along the lymphatics there was none in the ureteral mucous membrane. Previous experiments carried out by Stewart on dogs in 1910 proved that an ascending infection of the kidney occurred by the passage of organisms through the lymphatics or blood-vessels of the ureter.

Post-mortem Evidence of Nature and Origin of Infection in Purulent and Semi-Purulent Renal Infections.

Animal experimentation therefore shows that, while both descending and ascending infections of the kidney can be produced, the incidence under different experimenters and with different strains of organisms varies considerably and that we should therefore be in error in applying these results too closely to man. It is commonly held that ascending infections in man are frequent; yet there must be solid reason for the opinion of a clinician like Mr. Frank Kidd, who states that they are rare. To attempt to throw some light on the problem I have analysed the post-mortems done at the Radcliffe Infirmary by me or under my supervision during the last 20 years. Included in the series are 165 post-mortems done by me at the 3rd Southern General Hospital during the war, and also a small number done in private. The total number is over 1800. Amongst these are 109 cases of purulent or semi-purulent infections of the kidney. They exclude all cases of general acute or subacute nephritis in the ordinary meaning of the term, all cases of chronic interstitial nephritis whether of the small red or small white type, all cases of tuberculosis, all cases mainly due to calculus formation, and all cases of arterio-sclerosis proper.

I have included for purposes of comparison five cases of hydronephrosis without evidence of infection in which there was obstruction to urinary outflow. The records have been re-examined to determine whether the infection has been of the descending or the ascending type. No attempt has been made to distinguish between an infection travelling upwards by the urine, the mucous membrane, the lymphatics, or the blood. The clinical notes have also been studied, and I take this opportunity of rendering to my colleagues on the staff of the infirmary my grateful thanks for their permission to make use of the records of their cases.

The guiding points in deciding whether an infection of the kidney is to be included in the descending or ascending group have been as follows: (1) a purulent infection of the kidney substance, of whatever anatomical appearance, if it is associated with gross sepsis elsewhere—e.g., uterine—has been looked upon as of descending origin; (2) the infarct type of purulent infiltration of the kidney substance has been taken to indicate a descending infection; the kidney shows a triangular area infiltrated with pus or inflammatory cells with the base of the triangle towards the exterior of the cortex, or some lesion of the kidney parenchyma, purulent or semi-purulent, which may be derived from it; (3) if there is a purulent lesion of the kidney substance, even though not of the infarct type, while the pelvis of the kidney is unaffected, the infection has been taken to be descending; (4) a pyelitis with a more advanced infection of the kidney has been considered to be a descending infection; (5) a pyelitis with a chronic inflammatory lesion in the lower urinary tract has been looked upon as an ascending infection. By this method of division it is just possible that an ascending infection of which the pelvic inflammation had healed while the kidney had not would be placed in the descending group and conversely that a descending infection from which the kidney but not the pelvis had recovered would be considered as an ascending infection. The error from such cases would, however, be extremely small, for clinical considerations would act as a corrective. The evidence of disease in other organs, the previous history, and the clinical features of the patient have been compared with the anatomical lesions in the urinary organs in order to avoid too limited a view of the nature and time limits of the processes at work. The results appear to be clear-cut and the opportunity for bias reduced to very small dimensions

The total of 114 cases have been divided primarily into (1) those with no obstruction to the outflow of urine, 72 cases; (2) those with obstruction, 42 cases

(1) *No Obstruction to the Outflow of Urine.*

			Per cent
Total number of cases	72		100
Ascending infections	4		5·5
Descending or blood infections	57		79·1
Atrophic pyelonephritis	11		15·4
Pyelitis: Ascending infections 4; Blood 3; Atrophic pyelonephritis 3	10		13·7

(2) *Obstruction to the Outflow of Urine.*

			Per cent
Total number of cases	42		100
Hydronephrosis alone	5		11·9
Infection of kidney substance	37		88·9
Ascending infections	20		47·6
Descending or blood infections	17		40·4
Pyelitis: Ascending 20; Descending 2	22		52·3

It is remarkable that only four cases (5·5 per cent.) show an ascending infection in the absence of obstruction. These four cases were, first, a purulent epididymitis in a man of 50; secondly, ectopia vesicæ in a child of 13 days; thirdly, gonococcal salpingitis in a woman of 39; and, fourthly, a wound of the bladder which had been continuously open for 22 years in a man of 37. All were cases in which gross sepsis was present in the lower urinary tract.

The following is the list of clinical diagnosis in 37 cases of descending infection in which the source

of the infection is apparent, whether the spread of the disease be pyæmic, septicæmic, or metastatic.

	Cases.		Cases.
Appendicitis	6	Wounds, including gun-shot wounds	2
Puerperal fever	5	Strangulated hernia	2
Osteomyelitis	4	Pneumonia	1
Cellulitis	3	Duodenal ulcer	1
Abscesses	3	Gastric ulcer	1
Cholelithiasis	2	Bronchiectasis	1
Enteric fevers	2	Ulcerative endocarditis	1
Septic thrombosis	2	Septicæmia	1

In another group of six cases one or more patches of pyelonephritis, mainly of the infarct type, were found as accidental lesions with no clear relation to the disease from which the patient died. These included two cases of fracture of the base of the skull, and one each of pulmonary tuberculosis, diabetes, encephalitis lethargica, and pernicious anæmia. Another 19 cases had gross renal disease; they include 11 cases of atrophic pyelonephritis. Of these, 13 died with symptoms of chronic uræmia.

The total number of cases in which some form of obstruction occurred is 42; amongst these are the five cases of pure hydronephrosis without evidence of sepsis of the kidney or elsewhere. The causes of obstruction include enlarged prostate, calculus, tumours, and spinal cord lesions. Of the cases of obstruction to the flow of urine, therefore, 11·9 per cent. alone escape some form of renal infection. If it be true that in health organisms pass through the kidney substance without producing damage, it is permissible to suppose that in the 45·2 per cent. of descending infections a longer contact of organisms otherwise innocuous might produce damage, whether from their inherent power to injure or from an increase in their virulence by contact with tissues.

The conclusions from this analysis of post-mortem material is that purulent infection of the kidney substance is a lesion that occurs in 5·8 per cent. of general post mortems. Amongst cases that have some form of obstruction to the urinary outflow it occurs in 88·9 per cent., though amongst the cases without obstruction only 6 per cent. showed evidence of ascending infection, and in two of these there was a fistula of the bladder, in one case for 22 years. By far the most common infection of the kidney substance in man is an infection through the blood stream which occurs in 77 per cent. of all cases, whether obstructive or not.

Mr. Frank Kidd, who holds that ascending infection is rare, observes that infections of the urinary organs in either sex, other than gonorrhœa, show no tendency to spread to the opposite sex during marital relations. In two of my post-mortem cases there was gross sepsis of the bladder which had not spread to the kidneys. Sir John Thomson-Walker,[19] however, analysed 100 cases of *B. coli* infection of the urine and found 42 with bladder infection, the kidneys being sterile. In the rest of the 58 cases the urine from one or both kidneys was infected. This suggests that the bladder is a common initial site for a coliform infection, and that ascending infection is more usual. In these cases, however, the infection may have been descending, the renal pelvis having healed and the bladder only remaining infected. Further information is required before they can be fully explained.

THE LESION OF PYELONEPHRITIS.

Gross-blood infection of the kidney substance, such as occurs from an acute staphylococcal pyæmia, shows scattered abscesses throughout the kidney substance. In the common form of the very acute type of "surgical kidney" the organ is swollen, soft, hyperæmic, and generally infiltrated with inflammatory cells, but without abscess formation; this form may develop into gangrene. The commoner forms of kidney infection are, however, local, affect a segment of kidney substance, and may be generally described as of the infarct type. A wedge of kidney substance with base towards the surface is necrotic and breaks down into an irregular abscess cavity which discharges into the kidney pelvis, where it produces a perirenal abscess or is absorbed. In other kidneys, where presumably the embolic infection has been less compact, the area shows up in the surface as a group of small abscesses which also appear in section in that segment of the kidney corresponding to the abscesses on the surface. There may be several patches of such purulent infiltration, the intervening portions of the kidney substance being healthy. One kidney only may be affected, as in two cases of enlarged prostate in the obstructive group of my series.

In one case, a man of 56, there was hydronephrosis on one side and general abscesses, mainly cortical, on the other. In the other, a man of 70, who died 12 days after an accident which caused a fracture of the base of the skull, there was on the left side atrophic hydronephrosis and pyelonephritis, on the right side there was acute hydronephrosis.

Evolution of the Lesion.

The localised infarct type of pyelonephritis is capable of healing like purulent lesions in other parts; the scar comprises a segment of the kidney substance depressed on the surface, sometimes with a local dilatation of the pelvis. Some elements of kidney structure may still be recognisable in the scar tissue. Occasionally one sees loculated cysts occupying a segment of kidney substance, in shape very suggestive of an origin from a septic infarcted area, but I have not yet been able in any one case to attribute these lesions to pyelonephritis. A perirenal abscess is frequently due to a cortical abscess spreading to the perirenal tissues.

Apart from the ascent of an infection from below, pyelitis, as the sole complication of pyelonephritis, is rare and never amounts to a severe lesion. If, however, calculus formation occurs, then pyelitis is present either locally or generally, according to the amount of irritated surface. Or if, either from the dislodgment of calculi or obstruction of the ureter by septic discharges, the inflammatory matter is confined, then a pyonephrosis results. Five out of 62 of my post-mortem cases with descending infections had calculi as a secondary feature. Five others had pyonephrosis. One case showed ureteritis and cystitis and another showed prostatitis. Another interesting lesion is dilatation of the ureter, which was noted in 6 out of the 62 cases of descending infections; in three of these there was demonstrable obstruction. The explanation of these cases without obstruction is not obvious.

At the last meeting of the Association of Physicians Dr. A. F. Hurst showed a radiogram of an idiopathic dilatation of the left ureter which, he suggested, might be due to achalasia following changes in the nerve-cells similar to certain proved cases of achalasia of the œsophagus. The anatomical investigation of these cases has yet to be undertaken.

It is clear that the lesion of pyelonephritis is not of grave importance if localised. It has been twice seen post mortem as a purely accidental lesion, which cannot have seriously affected the health or have caused death, for instance, in post mortems for fractured base following an accident. If these were accidental lesions, there ought to be evidence of healing, and some of my post-mortems have, in fact, shown scars which, because of the appearance of the scar itself or the presence of a small recent patch of pyelonephritis, I took as evidence of this nature. Four cases showed abscesses closely neighboured by cysts, and in the fixed specimens of two of these the centre of the cysts contained clear colloid material and a peripheral purulent zone beneath the capsule. I am convinced that some of the cysts met with post mortem that are roughly classified as "congenital" have been caused by the healing of a localised pyelonephritis. The small recent patch of pyelonephritis produces no change in the size of the kidney. The patch itself may show on the surface as a slightly

swollen area, but does not affect the kidney as a whole. When the patch is large, or if the whole kidney is affected by abscess formation or general acute inflammation with or without distension of the pelvis, the kidney is enlarged. In some cases the lesion had been successive and different stages could easily be distinguished.

This was so in the case of a woman of 30 who died of uræmia. The left kidney was only 3 inches long, and showed recent pyelonephritis with local scarring elsewhere, probably from similar lesions. The right was 4 inches in length and had a medium-sized cyst at the lower pole and numerous abscesses and cysts elsewhere.

The proof that these kidneys had been subject to chronic repeated pyelonephritis lies in the segmental nature of the lesion, one portion being involved in a general abscess formation or acute inflammation, another in general fibrosis, while others preserve the normal relations of cortex and medulla without the slightest chronic fibrotic change. But kidneys which are subject to chronic interstitial nephritis are equally liable with the normal to be attacked by pyelonephritis.

Thus a woman of 27 who had suffered from chronic interstitial nephritis of the Rose-Bradford type (headache and vomiting for 12 months and eye changes for two and a half months) died from uræmia. Both kidneys showed typical chronic interstitial nephritis with secondary pyelonephritis of the infarct type.

That type of kidney inflammation which is caused by repeated attacks of pyelonephritis and scarring, and which is called atrophic pyelonephritis, is not so clearly recognised amongst physicians as amongst urologists. In my series of post-mortems there are 11 cases. It may occur on one or both sides; the kidney is small, contracted, and fibrosed, and in extreme cases there may be no kidney substance left. It is sometimes extremely difficult to distinguish from the kidney of chronic interstitial nephritis. The distinction is as follows:—

1. The atrophy in atrophic pyelonephritis is segmental, from healing and fibrosis of successively infarcted and inflamed areas, whereas in chronic interstitial nephritis fibrosis is general.

2. The surface of the kidney in atrophic pyelonephritis is affected unevenly in patches; some areas are depressed, smooth, and fibrous, or alternating with others but slightly affected, whereas in chronic interstitial nephritis the kidney is generally granular, whether fine or coarse.

3. A section of a kidney in atrophic pyelonephritis may show portions of kidney substance that bear the normal relations of cortex and medulla. All parts of the kidney substance are equally affected in chronic interstitial nephritis.

4. In the kidney of atrophic pyelonephritis the fibrosis is patchy; in the chronic interstitial variety it is generalised.

5. In the atrophy of pyelonephritis the kidney pelvis may show general dilatation or one or more calyces may be affected. In chronic interstitial nephritis the pelvis is unaffected and is not dilated. In the former there is sometimes a stone, in the latter rarely.

6. Both types give rise to urine which contains a small amount of albumin.

7. In chronic pyelonephritis atrophy may affect one kidney alone or one more than the other. In chronic interstitial nephritis "both kidneys are usually affected in equal degree." This fact is not against a blood infection, because infarcts, whether aseptic or septic, are sometimes found in one kidney only.

Surgical Evidence Bearing on Pyelonephritis.

I have said that pyelonephritis in its more localised form is a slight ailment and may be entirely incidental as compared with the main disease from which the patient is suffering; but some authorities assert that, in children at least, pyelonephritis is invariably fatal, because we see the lesion in cases that die, while the less severe pyelitis recovers. The subject may be studied from cases in which the kidneys have been actually exposed during the illness of the patient, when the symptoms can be clearly connected with the anatomical appearances. Not all cases operated upon have been severe, for the question of operation in particular conditions depends to some extent at least whether the patient comes under a physician or a surgeon. Though the recovery-rate in the following cases is high, it cannot be doubted that some of the patients would have got well, though perhaps more slowly, if treated by medicinal measures alone. The following list of cases is designed to illustrate the types of case suffering from purulent affections of the kidney. The examples are classified in descending order of severity.

(1) *Gangrene, Coliform Pyuria, Descending Infection.*

CASE 1.—Female aged 14.[20] Intense pain on right side, persistent vomiting, no urinary symptoms, no bowel action for five days. Abdomen tender and right loin rigid. A catheter specimen of urine was clear, but the deposit contained pus cells, hyaline and granular casts, and a coliform bacillus in large numbers. The kidney was enlarged to about the twice its ordinary size. The changes were cortical rather than pelvic. Most of the cortex was gangrenous, the veins being engorged with clotted blood. At the upper and lower poles could be seen streaks of pus in the tubules, and multiple pin-point abscesses. At one or two places small areas of living cortex could still be seen, but even in these there was cloudy swelling. The mucous membrane of the pelvis was moderately engorged with blood, and the submucous layer swollen with inflammatory products. The kidney was removed, the urine became sterile in ten days, and the patient recovered.

(2) *Acute, Generalised Inflammation without Abscess Formation. Descending Infection.*

CASE 2.—Female aged 33.[20] High temperature, rapid pulse; strangury, enlarged, tender right kidney. *B. coli* and pus in urine. There was extensive œdema of the perinephric fatty tissue and some excess of blood in this tissue. The right kidney was enlarged to more than twice its natural size. The fibrous capsule was stretched and tense. The whole organ was very hot, steaming, and so engorged with dusky blood that it bled on the slightest touch. On section the cortex bulged above the line of section and dripped blood, so that little detail could be observed. There were no multiple pin-point abscesses to be seen in the cortex. The opened pelvis contained an excess of foul urine under tension, presumably because the ureter was partially blocked by inflammatory swelling. This kidney returned to normal size in less than a fortnight, and from observations made on the urine it seemed clear that the inflammatory products had been entirely absorbed.

(3) *Generalised Abscess Formation.*

CASE 3.—Female, aged 23, married.[21] Sharp pain in left side of abdomen, so severe that she fainted. Chills and vomiting. Descending infection. The urine contained no pus, blood, or albumin. There was a leucocytosis of 26,000. Neither kidney could be palpated. At the operation, 26 hours after the first symptom, the left kidney was found to be enlarged and the perirenal tissue œdematous. It was covered with characteristic small dark and yellow spots, multiple septic infarcts which contained *B. coli*. The kidney was removed. The right kidney was normal in size and position. The patient made a prompt recovery.

(4) *Multiple Septic Infarcts.*

CASE 4.—Male, aged 27,[22] complaining of pain in the loin. The urine was acid in reaction, specific gravity 1018, and contained one-eighth of albumin when boiled and allowed to settle. Under the microscope the deposit contained abundant polymorphonuclear leucocytes. There were very few red corpuscles and no casts. At the operation the kidney was found to be about twice its normal size and intensely congested. Its surface was covered with a great number of subcapsular hæmorrhagic spots, the larger ones having yellow suppurating centres. The kidney was removed. On being divided vertically from cortex to pelvis it showed that the spots on the surface were the bases of wedge-shaped hæmorrhagic areas running into the pyramids. Submucous hæmorrhages were found at several points in the pelvis of the kidney. Sections were cut, but no micro-organisms could be demonstrated. The areas of inflammation were in the bundles of tubules forming the lobules, and not around the vessels between them. The patient recovered.

(5) *Local Infarction.*

CASE 5.—Female aged 32.[23] Pain in right kidney region. The urine was cloudy and contained 0·25 per cent. of albumin; in the deposit was pus and blood. There were no casts. At the operation the kidney was one-third larger than normal and much congested. In the middle quarter was an area about 1½ inches in length, of irregular surface,

and slightly harder than normal. The kidney was split along the convex border, and the area observed on the surface was found to involve the central quarter of the kidney down to the renal pelvis. This area contained several small foci of purulent material. The remainder of the kidneys howed congestion. A wedge-shaped piece, including the centre third of the kidney and about ½ inch outside the infected area, was resected. The patient left the hospital 15 days after the operation with a small, clean, granulating wound.

CASE 6.—An active, healthy, multiparous woman of 40 had an acute pain in her left side with fever and sweating. When seen on the third day of her illness she looked ill and septic. The tongue was coated, the pulse was relatively high, but the heart and lungs were normal. There was no sign of typhoid fever. The abdomen moved well and was not rigid; on deep palpation there was a localised area of tenderness in the left hypochondrium which could also be elicited by pressure on the last rib and below. The urine contained a small amount of albumin, a small number of pus cells, and a good growth of *B. coli*. Under treatment by hot fomentations to the loin and an abundant intake of alkaline fluids the attack settled down, the patient became afebrile, and the urine contained only a trace of albumin, and pus cells on centrifugalisation. It was judged at the time that the left kidney, which continued to secrete purulent urine, was badly and permanently damaged and would remain a source of danger. This kidney was subsequently excised. To external observation it was normal, but on section a whitish patch and lines located chiefly to the boundary zone and pyramids were found in one part. These were inflammatory changes in process of healing; they might have healed if the kidney had been left. In this patient the excision of the left kidney did not prevent the right ultimately becoming infected, for she suffered from repeated attacks of pain in the right loin, frequency, and pyuria. Since there was no evidence of disease in the bladder or urethra, the infection must have been transferred by the blood.

THE CLINICAL ASPECT OF PYELONEPHRITIS.

In order to understand the symptoms of pyelonephritis we must realise that the lesion may vary from a small infarction to an affection of the whole kidney, and that one or both kidneys may be involved. In 20 cases of surgically verified pyelonephritis symptoms and physical signs must have been present or operation would not have been undertaken; therefore they could not have been the mildest cases. So far as the details are recorded, pain in some form was present in 18 out of 20 cases, usually in the affected loin and once in the axilla. Rigidity of the abdominal muscles on the affected side is described once, and a tender kidney, without rigidity, four times. Vomiting occurred in 3 cases, frequency of micturition in 3, strangury in 1, and retention in 1. Definite pyuria occurred in 12 cases and chills or rigors in 3. Fever is only mentioned in 6 cases and a polymorphonuclear leucocytosis in 5. On post-mortem evidence it appears that the mildest form, the patchy type, may be present without the symptoms being such as to cause the patient to seek medical aid; thus in my post-mortem series there were two cases of fractured base in one case after a street accident and in another after a fall from a window. Two cases show evidence of pyelonephritis in which healing has been complete.

One, a male of 22, admitted for perforation of a duodenal ulcer, had a cicatrised patch in the right kidney, which was much smaller than normal. The left was hypertrophied; there were scars and a sinus leading to the left hip region and a shortening of the left femur, probably from old osteomyelitis. The condition of the leg and right kidney was almost certainly connected as cause and effect, which is confirmed by the fact that out of the total of 51 cases of descending infections there were four clear cases of pyelonephritis associated with acute osteomyelitis.

The other case, a male aged 40, who died of encephalitis lethargica, showed a renal scar with cysts and whitish points reducing the cortex to a small amount locally. This man had been wounded in the war. The urine contained no albumin, and was normal to naked-eye examination.

This case corresponds to another of gunshot wound with abscesses in both kidneys. These two cases show the benign nature of a localised non-recurrent pyelonephritis.

In the majority of cases without obstruction and without gross sepsis in the lower urinary tract the lesion was discovered post mortem and clinically was overshadowed by the main infective disease. Thus there are 5 cases of appendicitis, 5 of puerperal fever, 4 of osteomyelitis, 4 of cellulitis, and 2 of cholelithiasis. The diagnosis in the remainder were: septic thrombosis, cavernous sinus thrombosis, ulcerative endocarditis, anterior staphyloma, septicæmia, lumbar abscess, bronchiectasis and pneumococcal meningitis, broncho-pneumonia (three cases). In one case of typhoid the lesion was found post mortem; in another of paratyphoid B the kidney condition caused marked pyuria associated with a coliform organism. Diabetes accounted for two cases.

The acute attack of moderate severity is a febrile disturbance liable if prolonged to be mistaken for typhoid; there may be no local symptoms to draw attention to the site of the disease, especially if the urine be not examined carefully. Frequency of micturition may be entirely absent and its presence may depend upon the presence of pyelitis. The kidney affected may be, but is not necessarily, enlarged and tender. Pressure in the loin below the last rib may be painful. In doubtful cases pain may be elicited by hammer percussion over the suspected kidney.[24] Sweating, rigors, pain, and strangury are present in more violent attacks. If the lesion does not heal completely there may follow perirenal abscess, nephrolithiasis, bacilluria, pyelitis, pyonephrosis, and—if attacks have been repeated and destruction of the kidney marked—uræmia and its concomitant symptoms.

A classification of the various grades of attack would include (1) mild attacks which may pass without notice or perhaps slight discomfort; (2) moderate attacks which pass for what is ordinarily termed acute pyelitis; (3) septicæmic attacks, simulating typhoid or other grave conditions; (4) fulminating attacks in which the kidney may become gangrenous and death imminent. The last stage of a pyelonephritis in which there has been increasing destruction of the kidney substance is chronic uræmia, of the type showing gradual failure of bodily processes, usually without convulsions. Apart from atrophic pyelonephritis there were four such cases in my series of 51 descending infections. Nine out of 11 of the atrophic cases died of uræmia. In the obstructive cases, which were mostly surgical, the renal condition was frequently overshadowed and therefore not sufficiently investigated, but uræmia terminates many of these cases.

Clinical Aspect of Atrophic Pyelonephritis.

It is not possible to give a complete account of the symptoms, for the subject requires further study. Urinary symptoms need not be present or marked; all patients would appear to have neurasthenia or chronic ill-health and the terminal stage is chronic uræmia. Of the 11 cases in my series one, a female of 37, had had frequency and a tendency to enuresis all her life. Another, a male aged 57, had been delicate in infancy and had suffered from fits; there had been two fits in adult life, and at the age of 27 he had suffered from gravel. Another, a male aged 50, suffered from renal calculi in both kidneys and had had three operations. Two showed bone changes; one admitted for genu valgum had had fainting attacks and epistaxis. Another, an infant of 3, was mistaken for rickets at first, and for purpura on his second admission, during which he died. It is interesting to note that in this case the mother had suffered from the pyelitis of pregnancy. A girl of 11, ultimately found to be uræmic, was admitted with meningeal symptoms. A female of 25 had been epileptic for several years.

In some cases the blood pressure, both maximum and minimum, is normal. This is not to be explained by the fall in blood pressure that precedes the fatal issue in uræmia, because the hypertrophy of the heart, so constant a feature of true chronic interstitial nephritis, is frequently absent. Out of ten cases of atrophic pyelonephritis the heart was hypertrophied in four and normal in six. In one case, a female of 38, the heart was definitely less in weight than the normal (213 g. as compared with the normal

of 225–280 g.). Dr. Geoffrey Evans, in his paper on arterio-sclerosis in relation to renal disease,[25] refers to four cases of chronic renal disease without hypertrophy of the heart. The state of the cardiovascular system is independent of the blood-urea, for in the three cases in which this is recorded it was high, from 90 to 291 mg. per 100 c.cm. of blood. Two had cardiac hypertrophy. If there be any acute or subacute pyelonephritis the urine contains pus cells, a trace of albumin, and organisms; if the lesion be healed and fibrotic it may contain a trace of albumin only. The specific gravity is low. The ocular fundi were noted in 4 out of 11 cases; in 3 of these there was no change; in the fourth there were changes typical of chronic interstitial nephritis—namely, flame-shaped hæmorrhages, retinal changes, and œdema of the discs.

I had under my care in the first part of this year a boy, aged 3 years, who had been treated by my colleague, Mr. G. R. Girdlestone, for genu valgum. He was put under me by Dr. F. G. Proudfoot, who found him suffering from fever and frequency of micturition, with pus and blood in the urine. On admission he was a feeble, delicate-looking child. There was no evidence of rickets; the weight was 4 lb. below the normal for his age. There was no frequency and he was passing 1 pint of urine per diem, containing a trace of albumin and abundant *B coli*, which gave the freshly passed urine a fishy smell. The blood pressure was 94/55, and the blood-urea was 23 mg. per 100 c.cm. of blood. The ocular fundi were normal. The urea-concentration test produced extreme drowsiness for several hours and there was clear deficiency in urea excretion in the first hour. The urine was constantly bacilluric on alkalies, but it could be rendered clear for a few days if he were given an acid mixture with hexamine. It is reasonable to suppose that this child has suffered from chronic *B. coli* pyelonephritis for the greater part of his life. His mother, who was delivered in the maternity department of the Radcliffe Infirmary, had swollen hands and face for the last months of pregnancy and had albumin in the urine. Instruments were employed during labour, but the puerperium was normal.

Pyelonephritis in Children.

My series of post-mortems does not provide the necessary experience for independent conclusions. The recent study of Bruce Chown [26] indicates that in one group of children under 2 years it is an acute fatal disease secondary to gastro-intestinal, middle-ear, skin, or chest infections, that the symptoms are those of an acute infection with meningeal, gastro-intestinal, or respiratory disorder, and that there is pus and albumin in the urine. The kidney in these cases shows diffuse or focal suppurative nephritis, though actual abscess formation may not occur. The pelvis of the kidney shows no inflammation, and the organism mainly responsible is *B. coli*.

In a second group of four cases no clear reason for the pyuria could be discovered in the kidney post mortem.

In a third group there was chronic pyuria and some evidence of healing in the kidney.

One of Chown's cases in his first group was unsuspected during life, the child having died as the result of an operation for hydrocephalus; it therefore corresponds to my cases of accidental or unsuspected infection. Chown quotes three cases, two from literature and one which he had observed in the service of Dr. Emmett Holt, in which the lesion had been observed during life in operations upon the affected kidney. Chown concludes that the so-called pyelitis of infancy, in the absence of infection of the lower urinary tract, is a misnomer, and that the lesion of this disorder is renal. He does not include any example of atrophic pyelonephritis, but in view of the age of his patients this would not be likely. The youngest case of atrophic pyelonephritis in my series was three years old. Chown's cases were all under two.

Several authors [27] have called attention to the fact that pyelitis in children is a sequence to the pyelitis of pregnancy in the mother.

PYELITIS.

We are accustomed to speak of pyelitis, meaning an inflammation of the inner lining of the pelvis of the kidney, as a common lesion; it occurred in 32 cases (28·8 per cent.) in my post-mortem series. It has been assumed that an ascending infection cannot be present without it, but amongst the descending infections it is rare, five cases out of a total of 71, or 7 per cent. It was present in 22, or 52 per cent., of the 42 cases with obstruction in some part of the urinary tract. This agrees with the opinion of Helmholz [28] that clinically obstruction is a common cause of failure in the treatment of pyelitis in children. It was present in three, or 27 per cent., of the 11 cases of atrophic pyelonephritis assumed to be blood infections. Allowing for error due to the small number of cases, it is interesting to note in this type the higher percentage, corresponding to the longer duration of the infection, as compared with the percentage of seven in the recent blood infections.

Summarising, therefore, the occurrence of pyelitis itself in these purulent and semi-purulent infections of the kidney, it may be said that it is very uncommon in infections of the urinary tract in the absence of obstruction, and that when obstruction is present it is seen in roughly half the cases. For purposes of clinical diagnosis, therefore, if obstruction can be excluded it may be ruled out, for it seldom occurs in them apart from infection of the kidney substance, and, if present, it is slight and of secondary importance. If, in the absence of obstruction or gross sepsis of the bladder, the anatomical lesion of pyelitis is so rare as judged by post-mortem results, what is the lesion present in the large number of cases of so-called "pyelitis" that we meet in men, women, and children? I believe, on the evidence I have given, that they are with few exceptions cases of pyelonephritis. It cannot be doubted that most of the cases described would pass as cases of pyelitis in the ordinary course of practice.

But pyelitis as an anatomical lesion occurs under other conditions which have been deliberately excluded in this analysis. It occurs in tuberculosis of the kidney; the initial renal infection is commonly at the tip of one pyramid, and as it progresses there is an invasion of the whole renal pelvis until if there be obstruction in the ureter a tuberculous pyonephrosis is the ultimate result. Secondly, pyelitis occurs when there is a stone in the renal pelvis; irritation is set up and inflammation of the whole or part of the cavity follows, with or without obstruction. Another infection in which a pyelitis may be expected is gonorrhœa when extension of the disease occurs upwards. One of my post-mortems with an ascending infection had gonococcal salpingitis. The fulminating cases of gonorrhœa, with ascent of the infection, show the features of a surgical kidney; others have been recorded with renal abscesses. The chronic renal infections following gonorrhœa occur as a chronic pyelitis on one or both sides. The number of cases of gonorrhœal infection of the kidney reported in medical literature is very small. Prof. Turnbull has given a careful description of such a kidney in one of Mr. Frank Kidd's cases.[29] The renal pelvis was chronically inflamed and showed scattered cysts. The kidney had had to be removed for recurrent renal hæmorrhage.

THE URINE IN PYELONEPHRITIS AND PYELITIS.

Pus, in gross or microscopic amounts, may be present in the urine in inflammation of the urethra, prostate, bladder, kidney pelvis, and kidney substance. It may be discharged with cells that can be recognised as coming from the transitional epithelium which lines the kidney pelvis, ureter, and bladder, or with squamous epithelium from the urethra. Inflammation of the kidney substance may give rise to the presence of pus casts formed in the renal tubules. In the majority of cases of inflammation of the urinary tract no clear guide to the site of the inflammation can be obtained by any of the finer microscopic tests, and the examination of the urine should play an important but not a primary part in the scheme of examination. The main indication of the site of the lesion must be from clinical or special urological examination.

The state of the urine varies considerably in pyelitis and pyelonephritis. Frequently it may give very little help in diagnosis, and in some instances the absence of any abnormality may even divert attention from the kidney. In the first place a localised purulent infection of the kidney substance may be present without the slightest trace of abnormality in the urine; this is especially true in acute infarctions, which may be localised to the cortex.

An active school-boy, aged 10, whom I saw with Dr. John Wood, had had pain in the left iliac fossa six days previously, followed by fever. The pulse-rate was 110, temperature 101·8° F., respirations 18; there were no physical signs and the Widal reaction was negative. The urine, which had been negative to ordinary examination a few days before, was clear, contained no albumin, and on centrifugalisation showed a few pus cells and catarrhal cells of indefinite origin. Seven days later there was flexion of the left thigh and a painful swelling in the left loin, which proved to be a perirenal abscess from *Staphylococcus aureus*. This was opened and the boy made a good recovery.

In some cases of pyelonephritis there may be no albumin and so small a discharge of pus that it can only be recognised by microscopical examination of the centrifugalised deposit. In other cases of pyelonephritis the urine may show a trace of albumin which may be missed in a cursory examination of a turbid urine. In most cases of pyelonephritis from *B. coli* the naked-eye features of the urine are characteristic. The urine is cloudy, fails to clear on boiling, and the shimmer of bacilluria can be seen if it is stirred up with a glass rod. The fishy odour of the urine is characteristic of the infection. The presence of pus in the urine does not necessarily mean abscess formation in the kidney even if the kidney be the source of the pus; an inflammatory lesion due to one of the pus-forming organisms is sufficient. Gross septicæmia and pyæmia may be present without pus or inflammatory cells in the urine so long as the kidney substance is not affected. Cloudy swelling gives rise to slight albuminuria only.

The presence of blood in the urine greatly obscures any indications of renal disease of the purulent type. In the pyuria of pyelitis proper, as from a stone in the pelvis of the kidney, there is also pyuria, which is indistinguishable from the pyuria of pyelonephritis except that in the former tailed cells from the pelvic mucous membrane may be present.

The reason for bacilluria and the nature of the lesion or lesions if any is not clear. It occurs in typhoid fever without any indication of disease of the kidney post mortem. In one of Patrick's [29] cases, however, there were small abscesses in the left kidney. Bacilluria may exist for years in patients who may suffer from time to time from pyelonephritis and who may pass a small amount of pus either constantly or occasionally. A patient whom I watched for many years had a constant slight evening temperature of 99° or thereabouts, with constant bacilluria due to *B. coli*. During my care of her she had two attacks of so-called pyelitis. The bacilluria was not affected by any medicinal therapy, but a temporary disappearance followed a course of vaccine therapy.

Conclusions.

1. The lesion of pyelonephritis, either local or general, on one or both sides, is not a rare clinical condition.

2. It varies in its severity from an ailment that may pass unnoticed to one which is dangerous or lethal.

3. Recovery from the more local lesions is usual.

4. A tendency to recurrence leads ultimately to complete impairment of kidney function and a type of uræmia which may be different from that of chronic interstitial nephritis.

5. Pyelitis is secondary and rare in the descending or blood infections, but common when there is any form of obstruction in the urinary tract.

6. Pyelitis as a localised lesion without pyelonephritis is caused by ascending infections, tuberculosis, nephrolithiasis, and gonorrhœa.

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SYMPTOMS DUE TO MESENTERIC LYMPHADENITIS.*

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Mesenteric lymphadenitis is common—the physician, surgeon, and general practitioner are equally likely to see cases—and its manifestations are so numerous and it mimics so many other conditions that our knowledge is constantly advancing and, it is to be hoped, will still advance. I am by no means certain that the conclusions arrived at so far will all be verified by the future. We are greatly indebted to the researches of J. K. Jamieson and J. F. Dobson on the anatomy of the lymph glands draining the intestines.

The glands of the small gut are said to number about 200, and they lie in three sets between the layers of the mesentery: (1) the primary set, lying close to the margin of the bowel; (2) a secondary set, more numerous, arranged along the loops of the arterial arcades and the rami intestinales; (3) a third set, more numerous still, accompany the main trunk of the superior mesenteric artery. The glands draining the ileocæcal angle are as follows: (1) ileal, in the mesentery of the terminal ileum; (2) anterior ileocolic, (3) posterior ileocolic, in the angle between the ileum and cæcum; (4) appendicular, one gland, not constand, in the meso-appendix. The glands draining the large intestine are described in four groups: (1) the epicolic, lying on the bowel wall; (2) the paracolic, along the arterial arcades; (3) the intermediate, lying along the course of the main colic

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vessels; (4) the main group, around these arteries at their origin. Some of the lymph nodes draining the colon lie very close to the ureters, a fact of clinical importance.

Morbid Anatomy.

Inflammation of the lymphatic glands may be simple or tuberculous.

Simple lymphadenitis is a constant feature in infections of the wall of the alimentary canal, such as appendicitis, and is sometimes seen when no cause is apparent. There is no clear evidence whether the gland infection is due to *Bacillus coli* or to cocci or to both. Suppuration presumably occurs, but we seldom see it. The lymph nodes in simple lymphadenitis are enlarged, soft, white or pink on section, and not usually adherent to the layers of the mesentery. It is difficult to say just what degree of enlargement constitutes a pathological state; roughly, the glands that are readily visible at an ordinary operation for appendicectomy ought not to be larger than a good-sized pea.

Tuberculous lymphadenitis in some of its forms is not easy to distinguish by the naked eye, either externally or on section, from simple lymphadenitis. In the later stages it goes through the usual changes: caseation, softening, scar-contraction, or calcification. The gland often becomes adherent to the intestine or to the layers of the mesentery. Not uncommonly it is stony hard, and there may be sharp points protruding through the mesentery.

There is universal agreement that mesenteric lymphadenitis, whether simple or tuberculous or undetermined, is very common, at any rate in children. At autopsies on tuberculous subjects it is almost constant, and in children who for any reason come to laparotomy it can generally be found if sought (Corner). Sometimes very many glands are found uniformly enlarged, and in other cases there are only a few, which may attain a great size, the favourite site being in the angle between the terminal ileum and the cæcum.

Physiology.

The lymph nodes act like a sewage farm, detaining bacteria and other deleterious matter drained to them from the bowel by afferent lymphatic vessels, and like a sewage farm they may become a nuisance if they are overloaded with work, especially if they have to deal with a big dose brought to them very rapidly. More interesting, and of great importance for our present purposes, is their relation to deep afferent nerves. The presence of Pacinian corpuscles in the mesentery provides a clue which is worth following up. We have learned much physiology from operations on conscious patients under local anæsthesia. I have removed the greater part of the stomach, performed gastrostomy, gastro-enterostomy, cæcostomy or enterostomy, with the aid of novocaine injected into the abdominal wall, without any anæsthetic at all for the abdominal viscera. It is simple truth to say that the majority feel no pain at all; indeed, if they have been given a small dose of morphia and scopolamine they usually get a nap during the operation. But to secure success one thing above all others is essential: there must be no pulling or pressure on the mesentery. To introduce the hand through a rather small opening for purposes of exploration is quite enough to upset the patient. We may cut or crush the bowel with impunity, or lift it about gently, but we must be exceedingly respectful to the mesentery. The phenomena of abdominal pain confirm this observation. As Tyrrell Gray has pointed out, a child with intussusception is quite happy between the attacks of colic, although the intestine is distended and swollen, but when peristalsis occurs the mesentery is pulled upon and pain begins. When an ulcer in the stomach or duodenum perforates, the peritoneum is irritated, and there is violent and persistent pain. No doubt Pacinian corpuscles are sensory end-organs in the very sensitive mesentery.

We may therefore believe that an innocent-looking lymph gland in the mesentery, when it suffers inflammation and swells, especially if it becomes adherent to the peritoneal covering and fixes it, may be a source of pain. Waves of peristalsis which normally would give rise to such gentle movements of the mesentery that we should be unconscious of them, may, under these circumstances, become acutely painful, yet the pain may be of short duration.

Symptoms Due to Mesenteric Lymphadenitis.

It is difficult in some cases even at operation to decide whether an enlarged gland is simple or tuberculous. So I shall not attempt to draw a distinction all the way through. It will be necessary to adopt quite a complicated classification to cover the ground. My illustrative cases are drawn almost entirely from my private practice of the last few years, because the notes are much more reliable than those of hospital cases.

1. *General symptoms due to tuberculous mesenterico-lymphadenitis.*—It is well known that tubercle bacilli may lie latent for many years in the bronchial or mesenteric glands, and then leak into the lymphatic or vascular circulation and either cause fatal acute miliary tuberculosis, or settle in some joint or bone, and give rise to tuberculous disease. There is another group of cases in which the diagnosis is more a matter of guesswork than of proof, but in which I strongly suspect that tuberculous mesenterico-lymphadenitis or bronchial lymphadenitis is the hidden cause of the trouble. One sees from time to time children, about 6 to 10 years of age, who tire easily and go off their food, but show no other symptoms whatever. If the temperature is taken regularly, it will be found that there is a rise to 100° or 101° F. every night for weeks or months or even years. Yet the child never seems really ill, and a routine medical examination shows no cause.

It seems to me a reasonable suggestion that the mesenteric glands, which we know are so often found in unhealthy children, may frequently be the cause of the fever. One certainly finds children who get attacks of fever without obvious cause, who eventually develop the clinical picture of mesenteric lymphadenitis which we shall shortly describe.

2. *Violent pain simulating renal colic.*—I have seen several patients whose pain was as severe as I have ever witnessed from any cause (except perhaps acute pancreatitis). Two in particular linger in my memory.

Six years ago I was asked to see a middle-aged man who had had three attacks of very severe pain in the lower abdomen within a year, with a tendency to frequency of micturition during the attack. The pain lasted about half an hour. A physical examination revealed nothing. Next day I was urgently summoned, as he was in agony. I found him walking his bedroom doubled up with violent pain in the left iliac fossa. I diagnosed ureteral colic, and gave morphia. Skiagrams showed shadows apparently typical of ureteral stones, but in the right ureter, whereas his pain had been on the left side. Cystoscopy showed nothing. I opened the abdomen and removed two calcified glands from the mesentery of the ileum, lying close to the ureter. Nothing else could be found, and he had no return of the symptoms.

Last January a medical man brought a nurse of 20 to see me from the country. She had had an attack, diagnosed as right renal colic, in London three weeks before, and had been sent to one of the leading London hospitals where they told her that she had passed a renal stone, but that more were left behind. When I saw her she had been for 24 hours in the most excruciating pain, quite unrelieved by large doses of morphia and atropine. There was no sickness, no hæmaturia, and no bladder irritation. She and the doctor had had a very trying journey on account of her sufferings: she was sitting up and hugging herself, and showing all the signs of great pain. A skiagram, obtained only with difficulty, showed shadows along the line of the left ureter. In view of the severity and recurrence of the pain I did not wait to pass ureteral catheters, but operated forthwith. The kidney and ureter were normal, but there were four stony glands in the mesentery close to the ureter, which were removed. She has had no further pain as far as I know.

Most surgeons will have seen patients with pain who show shadows that might be ureteral stones but which are, as a matter of fact, phleboliths or calcified glands, but it is not generally recognised that the pain may be so violent. Sir John Thomson-Walker has, however, described the condition in children, and mentions that out of 28 cases the pain was a dull ache in 4, moderate in 7, and quite severe in 14, lasting from a few minutes to several hours, and much worse than appendicitis.

3. *Mesenteric lymphadenitis simulating appendicitis.* Several surgeons (J. Fraser, Braithwaite, Carson, Risley, and others) have referred during recent years to the close similarity between symptoms of this condition and of appendicitis. In my experience more mistakes in the diagnosis of acute appendicitis arise from this similarity than from any other cause. Of my last 200 operations on a probable diagnosis of appendicitis, 12 (=6 per cent.) proved on exploration to be mesenteric lymphadenitis. It is true that in several of these lymphadenitis was thought to be a likely diagnosis, and in a few lymphadenitis was probable and appendicitis only possible.

Out of a dozen private cases in which it was difficult to distinguish between appendicitis and mesenteric lymphadenitis, one was an infant of 21 months, ill three days with abdominal pain and fever, and distended, with slight tenderness in the right iliac fossa. There were very many enlarged and inflamed glands. Three were adults, all females, giving a history of several attacks of pain in the epigastrium and right iliac fossa. The pain might last a few hours or some days. They complained of dyspepsia, and all had vague tenderness over the appendix. The temperature was not raised. In each case removal of the glands, which were situated in the ileocæcal angle, stopped the attacks. Eight were children between 8 and 16, most of whom had suffered from repeated attacks of not very acute pain in the lower abdomen, lasting from a few minutes to several days. In all but one there was also fever, from 100° to 102°. They were not usually sick. There was generally tenderness over the appendix, but this was not marked. A leucocyte count in one case was normal (the inflamed glands were microscopically examined, and found not to be tuberculous). Removal of the glands was carried out in all but one case, and there were no further attacks, except in the patient where removal was impossible on account of the great number of glands involved. He had further attacks, but eventually "grew out of it."

I find my age-analysis of the cases and their symptoms gives much the same results as Braithwaite's series, though carried out before I had studied his article.

We are not in a position to lay down a table of differential diagnosis which will enable us to avoid making mistakes between appendicitis and mesenteric lymphadenitis, but the following general remarks may help. If there is much sickness, and the tenderness in the right iliac fossa is very marked and definite, or, of course, if there are symptoms of local peritonitis, the diagnosis of appendicitis is safe. On the other hand, relapsing attacks of pain and perhaps fever, with vague tenderness over McBurney's point, leave us in doubt. Possibly a leucocyte count will help, but it may be raised to 15,000 in lymphadenitis (Risley), and it is not invariably raised in subacute appendicitis. Somewhat indefinite tenderness and absence of rigidity by no means negative a diagnosis of acute appendicitis. Fraser says that the early fever and sudden cessation of the pain are in favour of lymphadenitis. But we must frankly admit that at present there are cases in which we cannot be sure, and under such circumstances I tell the parents so, but advise operation. It is true that if one could eliminate appendicitis for certain it would be justifiable and in some cases wise to wait for a spontaneous or medical cure. But the fact remains that removal of the glands, if they are localised to the ileocæcal angle, as they generally are, in the type of case where appendicitis is simulated, stops the pain and fever and prevents further attacks, which, from the patient's point of view, is quite satisfactory. Naturally one removes the appendix as well.

4. *Vague abdominal pain in children.*—Every practitioner sees quite a number of children who suffer from more or less frequent attacks of mid-abdominal pain, not related to food, with or without a rise of temperature. The pain may only last a few minutes or it may persist for days. A routine examination reveals nothing at all. The appetite may be capricious, and there is sometimes a little diarrhœa. No doubt this rather vague clinical picture covers more than one pathological cause, but knowing what we do about mesenteric lymphadenitis, its widespread occurrence, and the way in which it manifests itself when the glands lie close to the appendix and so get operated on and recognised, it seems all but certain that the majority of these children are afflicted with mesenteric glands, either tuberculous or simply inflamed. Carson describes the pain as absolutely typical. "Sudden centralised abdominal pain, severe enough to make the child cry, lasting 15 minutes or less, relieved by pressure and hot applications, recurring perhaps two or three times a day and stopping as suddenly as it began, so that in the intervals the patient is quite free." The probable cause is colic pulling on the mesentery where it is tied to the inflamed gland. One cannot be dogmatic, but it is some satisfaction to be able to offer a reasonable explanation, and to express the opinion that time will usually cure the condition. Tuberculous glands in the neck would strengthen the diagnosis. If the glands are calcareous, they may show in a skiagram.

5. *Lumps in the abdomen.*—In a few cases tuberculous glands may be big enough to form an easily palpable swelling, rounded in outline, slightly tender, and fairly firm in consistency. The lump may be single, or there may be multiple masses filling the abdomen; I have seen one or two examples of both. The nature of the lump may be uncertain, and it will probably be explored. If it can be removed all is well, but sometimes it has to be opened for diagnosis and then cannot be removed. It is a grave error to leave it within the abdomen to exude tubercle bacilli; I have heard of tuberculous peritonitis as a result. Under these circumstances I have scooped out the caseous material and sewn the edges of the gland to the anterior abdominal wall, thus marsupialising it and leaving it to discharge itself out. The result was quite satisfactory.

6. *Catastrophes.*—On rare occasions tuberculous mesenteric glands may lead to an abdominal catastrophe. One was recently reported by Sims, in which a mass of glands as large as an orange in the right iliac fossa of a child of 5 was ruptured by a slight injury, and symptoms like those of perforative peritonitis, with shock, fever, and rigidity ensued. The child recovered after operation. On one occasion I saw a man with acute intestinal obstruction of small intestine type. A laparotomy was performed, and the cause of the obstruction was found to be an acute kinking of the ileum by scar-contraction of an old tuberculous mesenteric gland, which had tied the gut down to the base of the mesentery.

Treatment of Mesenteric Lymphadenitis.

No doubt if we could be sure of the diagnosis the great majority of cases could safely and wisely be left to the physician to treat by fresh air, good food, sunlight, ultra-violet light, and simple remedies. The great majority would get well in the course of years. In certain groups of cases, however, the best treatment is surgical. The indications are: (1) when the attacks of pain are very violent and come at frequent intervals; (2) when there is a fair probability that the trouble may be due to appendicitis; (3) if there is a large lump and the nature is not certain; (4) in the presence of an abdominal catastrophe. If the enlarged glands are few and not densely adherent to the bowel, and

if they are localised to the right iliac fossa or lie near the ureter they should be removed. The removal is not easy, because one must take great care not to crush or cut the gland itself, and the mesenteric arteries bleed freely. The gap must be sutured after the gland has been taken away. If it is adherent to the bowel it is better to let the gland alone, or a fistula may result. The appendix will, of course, be removed. If the glands are numerous, or if they look angry and acutely inflamed, it is wiser to leave them alone.

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THE "RANGE OF UREA-CONCENTRATION" TEST.

AN ANALYSIS OF RESULTS AND A SUGGESTED MODIFICATION.

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THE range of urea-concentration test introduced by Dr. E. G. B. Calvert in 1924 and fully described by him in January, 1925,[1] has now been in routine use for over three years in the wards of the Medical Unit of St. Mary's Hospital. It is thus possible to attempt an estimation of its value. As it is simple and easily carried out,* both for in-patients and ambulant cases, the test has received somewhat general acceptance as a valuable aid in the difficult problem of nephritis and renal efficiency. It is therefore of interest to analyse to what extent it is of actual assistance in such cases, what are its limitations, and how it compares with other kidney function tests, especially MacLean's urea-concentration test, of which it is a modification. For this purpose 75 patients have been studied; in each case the clinical condition has been carefully noted and results have been correlated with this and with other laboratory investigations—e.g., degree of albuminuria, blood-urea estimations, and, when possible, the post-mortem findings.

Calvert's test is one of renal efficiency as a whole only, and cannot give accurate information as to the exact pathological lesion, or precise portion of kidney tissue affected, in any given clinical condition. It is partly owing to this failure—common at present to all kidney function tests—that the pathological and clinical nomenclature in nephritis is so often confusing. Thus the clinical term "chronic interstitial nephritis" may represent histologically a late stage of parenchymatous—i.e., glomerulo-tubular nephritis—or a condition which is essentially arterio-sclerotic. I have considered such cases under the two general pathological names "small white" and "small red," the former including the "primary contracted" group of Rose Bradford. These correspond approximately to the two clinical types of German authors (Schlayer [2] and Fahr [3]), "malign sclerosis" (the white arterio-sclerosis of Volhard), and "benign" hypertonia or "red" arterio-sclerosis. The former is the true glomerulo-nephritis in its third or contracted stage, and follows the so-called parenchymatous nephritis (second stage) of "large white kidney" which clinically produces the hydræmic type of nephritis, characterised by albuminuria, œdema, and chloride retention. This group is little represented in this series and in its pure form—nephrosis—seems increasingly uncommon. Of these three groups—the "small white," "small red," and "large white"—it is in the first that Calvert's test is of the greatest value, though it may also be of assistance in the differentiation of groups 1 and 2, which is often a matter of considerable clinical difficulty. It is perhaps least reliable in group 3.

The results of the range of urea test represent the maximum concentration of urea in the urine following a dose of 15 g. of urea, and the minimum concentration following the taking of a pint and a half of fluid. In order to correlate these figures in some degree I have suggested the "urea index" as a convenient single number to gauge approximately their relationship. By the "urea index" is meant the value of the urea range—the difference between the maximum and minimum figures—as a percentage of the maximal concentration. This is of particular service in the recognition of the presence and degree of nitrogen retention.

Groups 1 and 2 (cases of "chronic interstitial nephritis" showing cardiovascular change with high blood pressure).

In the majority of these cases—43 out of 53, or 81 per cent.—MacLean's figure (maximum urea concentration) is low, 2 per cent. or less, and they may be divided from the point of view of the range of urea test into two types, which correspond with some closeness to the groups 1 and 2 described above. In the first the urea range shows a parallel diminution with that of the maximum concentration; in the second a poor "MacLean figure" is accompanied by a relatively good range—i.e., a high urea index. Of these 43 cases, which all have a maximum concentration not greater than 2 per cent. (above this percentage kidney efficiency is by many considered as normal (Elwyn),[4] (Beaumont and Dodds) [5]), 34, or 79 per cent., show a range of under 0·5 per cent. with an index in no case greater than 25. The remaining nine cases having this low MacLean figure but a urea index over 25 all have a blood pressure much above normal, six, or 66 per cent., of them with systolic readings of 220 mm. or higher. All have normal blood-urea values except one (87 mg. per 100 c.cm.). Seven show marked arterio-sclerotic changes in the retina; one only shows some degree of "albuminuric retinitis," and in this case alone is any history of previous kidney disease recorded. The average age of these patients is 57 and all show thickened palpable vessels; not one has come to post mortem. This group, therefore, appears with one exception to correspond rather to the "small red" than to the "small white" group.

Early Detection of Renal Insufficiency.

Of the former 34, 27, or 80 per cent., have blood-urea values above normal (greater than 40 mg. per 100 c.cm). Sixteen have indices of 10 or under, and all of these show values above 70 mg. per 100 c.cm. The five autopsies among the 34 all show fibrotic changes of the kidney of the true contracted glomerulo-nephritic type without marked atheroma of the small vessels. Fifteen of these cases (44 per cent.) show retinal changes typical of chronic nephritis (exudation and hæmorrhages of albuminuric retinitis). Only one case among all those showing definitely renal retinitis has a urea index above 21. In these cases, therefore, the urea index is seen to bear a close inverse proportion to the degree of nitrogen retention: under 12 it is always associated with a blood-urea above normal, while above 25 it appears to suggest the "small red" rather than the "small white" kidney, and to be strong evidence against the presence of any but very slight nitrogen retention. In this respect the test confirms the view (Schlayer) that the "benign" essentially arterio-sclerotic kidney ("nephro-cirrhosis arterio-sclerotica"), which is clinically so difficult to distinguish from the early malign or "secondary contracted" type, retains a better diluting power than the latter, which shows a constant polyuria but fails to produce good excretion of an added dose of water. This failure of "excess water excretion"

* A description of Calvert's test is given at the end of this article.

points to the presence of an "inflammatory" condition of the kidney, which is borne out by Calvert's test in which the second specimen (B) of urine does not show dilution much below the first.

The criticism, therefore, that has been levelled at MacLean's test—that it does not detect renal insufficiency until it is somewhat pronounced (Bain) [6]—can be applied with less justice to Calvert's test, which is sometimes able to detect changes pointing to early contraction of the kidney before MacLean's test arouses suspicion. Thus of ten cases clinically diagnosed as belonging to the group "chronic interstitial nephritis," but showing little impairment by MacLean's figure—i.e., maximum concentration above 2—five show also a good urea range (urea index above 25). The remaining five are of especial interest since, with a maximum concentration between 2 and 3 (or higher), the additional evidence of the range of function may enable us to detect "failing" kidneys that MacLean's test will adjudge as sound. Such early defect of range, though pointing to true secondary contraction of the kidney, does not always justify a much worse prognosis than in the former five with good range, and as the disease progresses the range falls pari passu with MacLean's figure.

The following examples illustrate these points, the first two (*a*) taken from the group of 43 showing impaired maximum concentration, the last four (*b*) from the ten cases mentioned above, with no impairment of maximal concentration.

(*a*) With impaired maximum concentration.

Group 1.—"Small white" kidney (impaired maximal concentration and impaired range).

Male aged 44; albuminuria 0·15 per cent.; history of nephritis; no œdema; systolic blood pressure 225; severe "albuminuric" retinitis; urea concentration: maximum and minimum, 1·1 per cent. each = range 0; urea index 0. Blood-urea 300 mg. per 100 c.cm.

Post-mortem Report.—"Kidneys small, fibrotic, contracted, granular. Contain multiple subcortical cysts; capsules strip with difficulty, leaving a finely granular surface; cortex very pale and markedly diminished."

Group 2.—"Small red" kidney (with impaired maximum concentration, but unimpaired range).

Female aged 56. Traces of albumin; slight œdema of ankles; no casts; vessels thickened; systolic blood pressure 190; no retinitis. Urea concentration: maximum 1·8 per cent., minimum 0·6 per cent. = range 1·2; index 68. Blood urea 27 mg. per 100 c.cm.

(*b*) With no impairment of maximum concentration.

Female aged 34. No œdema; albuminuria 0·2 per cent.; casts present. Blood pressure 190/140; retinitis; history of pregnancy—toxæmia; pericarditis. Urea test: maximum 2·6 per cent., minimum 2·4 per cent. = range 0·23; index 9. Blood-urea 53 mg. per 100 c.cm.

Male aged 61. No œdema; albumin present; no casts. Blood pressure 220/140; retina "arterio-sclerotic." Urea test: maximum 2·9 per cent., minimum 2·2 per cent. = range 0·7; index 24. Blood-urea 55 mg. per 100 c.cm.

In these two cases clear evidence of impairment is shown by Calvert's test, in contrast to MacLean's figure. The following show both good maximum figures and good range.

Male aged 50; no œdema; albumin and granular casts present. Blood pressure 210/135. Urea concentration: maximum 3·1 per cent., minimum 1·3 per cent. = range 1·8; index 58. Blood-urea 30 mg. per 100 c.cm.

Six months later this case showed the first sign of renal deficiency—detected at once by Calvert's test: maximum 2·9 per cent., minimum 2·3 per cent. = range 0·6; index 21. And at this time the blood-urea was 50 mg. per 100 c.cm. and some retinitis was present.

Female aged 52. No albumin; no casts; blood pressure 240/145; retina normal. Urea test: maximum 3·1 per cent., minimum 0·9 per cent. = range 2·2; index 71. Blood-urea 41 mg. per 100 c.cm.

Further cases would show in the same way with what extra confidence the good urea range in association with the good MacLean figure enables us to report: "little renal involvement." In cases of "small white" and "small red" kidney, Calvert's test is thus of value as an estimate of the severity of the condition, as some guide in differentiating the two groups, and as a useful index of nitrogen retention. A good maximum concentration with a good range is characteristic of arterio-sclerosis with no renal insufficiency; an impaired maximum concentration with a good range of arterio-sclerosis *with* renal involvement (renal arterio-sclerosis or "small red" kidney), a bad maximum concentration with a bad range, of true "malign" contracted or "small white" kidney. Its prognostic import and its slight though definite advantages over MacLean's test are clear.

Value of the Test in Parenchymatous Nephritis.

In acute nephritis only the severer grades show impairment of function by Calvert's test, but its value should be most apparent in subacute parenchymatous nephritis or "large white" kidney. Calvert states that the range is limited, though set at a high level, and it should thus give more information than MacLean's figure, which is normal or high in these patients. Its results are, however, somewhat conflicting even though, as emphasised by Calvert, they are always viewed in conjunction with all the clinical data available—especially with respect to circulatory failure. A feature of these cases is impaired water excretion, and, though Calvert's test gives some estimate of this impairment, it can only be viewed as a modified water-test, as used so widely on the continent (Rosenberg)[7], Volhard).[8] In some of these cases the urea range is found to be surprisingly good, and this appears to be partly due to the varying diuretic effects of excessive water-drinking, which in many cases acts as a somewhat short-lived stimulus, while in others the effect is spread over a longer period. A healthy kidney will excrete a draft of 30 oz. of water within three and a half to five hours; some excrete the majority, say 20 oz., within one and a half hours, others excrete relatively little during the first hour, and the main bulk during the second and third hours, and this is the most usual response (Schlayer). The examination of any one given hourly sample—or a sample of the total first two hours' output as in Calvert's test—does not therefore give so good an idea of the power of water excretion as does the study of the total response over a longer time, such as is obtained by the performance of Volhard's simple "Wasserversuch."

Calvert's original test, however, takes little note of these factors and must thus be considered incomplete, though the results of such water tests—however thorough—cannot alone elucidate the conditions underlying these results, which may be produced either, for example, by passive congestion of the kidney or by "chronic parenchymatous nephritis." An example may make this clear. A short lasting diuresis produced a low urine urea percentage, giving a Calvert minimum figure of 0·8 per cent., while by Volhard's water test more than 450 c.cm. (of the 850 c.cm. given) were retained at the end of ten hours, in spite of this temporary dilution.

Male aged 14. Slight œdema; blood pressure, 98/70; albumin and casts present. Urea-concentration test: maximum 5·8 per cent., minimum 0·8 per cent. = range 5; index 86.

Total urine excretion and specific gravity after 30 oz. of fluid, at hourly intervals: (1) ℥ ii., 1025; (2) ℥ iv., 1010; (3) ℥ iv., 1009; (4–6) nil; (7) ℥ ii., 1035; (8–10) ℥ i., 1035.

For these reasons Calvert's test may give fallacious results and should, therefore, be combined as a routine with urine estimations, as in Volhard's test. The hourly output should always be measured and its specific gravity noted until the total amount of fluid given (30 oz.) is excreted, or until the lapse of at least ten hours. Even in its original form, however, Calvert's test can often be of help, and the following examples demonstrate its usefulness.

1. Male aged 17. Acute nephritis with œdema, hæmaturia, and albuminuria. Successive tests gave (*a*) maximum 1·6 per

cent.; minimum 1·2 per cent. = range 0·4; index 25. Blood-urea 56 mg. per 100 c.cm. (*b*) Maximum 2·75 per cent.; minimum 1·55 per cent. = range 1·2; index 44. Blood-urea 56 mg. per 100 c.cm. (*c*) Maximum 2·75 per cent.; minimum 0·85 per cent. = range 1·9; index 70. Blood-urea 41 mg. per 100 c.cm. And at the same time albumin and casts disappeared from the urine and a clinically perfect recovery was made.

2. Male aged 36. "Acute nephritis"—œdema; albumin ++, blood pressure 160/120. While in hospital the test gave: (*a*) Maximum 2·07 per cent., minimum 0·65 per cent. = range 1·40; index 70. Blood-urea 16 mg. per 100 c.cm. And later: (*b*) Maximum 3·15 per cent.; minimum 1·85 per cent. = range 1·30; index 43.

Here the test suggested some "parenchymatous change," and in two years' time the patient showed marked water retention, some œdema and albuminuria, and the test gave the following figures: Maximum 4·2 per cent., minimum 4·0 per cent. = range 0·2; index 4·5.

3. Female aged 21. Subacute nephritis; albumin 2 per cent.; many casts; urine scanty; blood pressure 100/90. Test results: maximum and minimum 4·2 per cent. each = range 0; index 0.

Marked clinical improvement was accompanied by the following figures: Maximum 4·45 per cent.; minimum 1·75 per cent. = range 2·70; index 60.

Four years later the patient had no albuminuria and no œdema and the test showed: Maximum 3·1 per cent.; minimum 0·8 per cent. = range 2·3; index 74.

She was then in excellent health and no casts could be found in the urine. Here the good prognosis, as judged by Calvert's test, appears to be fully justified.

In a few cases, however, the test has proved actually misleading, and the second specimen has shown a good dilution of urea.

Female aged 10. Moderate œdema; albumin 1 per cent.; casts present. Systolic blood pressure 118; blood-urea 47 mg. per 100 c.cm. Test gave maximum 2·9 per cent.; minimum 0·6 = range 2·3; index 79.

Renal function was apparently efficient, but at autopsy shortly after the test the report was: "swollen, pale, large, white kidneys." Had the full water estimation been performed there is little doubt that the good diuresis at two hours in this patient would not have continued, and a truer idea of the renal function would have been obtained.

With the modification suggested, however, more reliable and consistent results may follow and permit of clearer judgment of kidney function in these difficult cases, which offer a diagnostic and prognostic problem that Calvert's original test has not been able regularly to solve.

Calvert's Test.

The patient takes his usual food, but no fluids from 12 noon. At 9 P.M. the bladder is emptied and 15 g. of urea are drunk in 4 oz. of water; at 10 P.M. the bladder is again emptied and the urine discarded. The patient then goes to bed and all the night urine, together with that passed on rising—say 7 A.M.—is kept. A sample (A) of these mixed portions is analysed for its urea content. The patient then drinks 30 oz. of weak tea or water and the urine passed up to the end of two hours—9 A.M.—is kept and a sample (B) again analysed for its urea percentage. The two specimens A and B represent the maximum and minimum concentrations of urea in the urine and the difference between them the urea range.

I am greatly indebted to Prof. F. S. Langmead for permission to investigate these patients, who have all been under his care, and for his kindness and assistance to me in the preparation of this paper. I am also indebted to Dr. E. G. B. Calvert, who performed the greater number of these tests.

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AN INTRODUCTION TO THE MECHANISTIC CONCEPTION OF ECLAMPSIA.

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IT is safe to say that Matthews Duncan's teaching has had a profound and lasting effect on obstetric thought. When an undergraduate I read with some assiduity his clinical lectures, and was especially struck with his conception of the retentive power of the abdomen. He believed that during pregnancy the base of the thorax expands and aspirates the uterus upwards; thus, as pregnancy advances, the pressure above the uterus being constantly negative, the organ naturally grows upwards. The liver, being placed between the diaphragm and uterus, simulating, if you like, the sucker of a syringe, according to this hypothesis must itself be drawn upwards by the thoracic aspiratory effect, and thus is not compressed during pregnancy. He unconditionally rejected the conception, promulgated in his day even by "good authors," that the gravid uterus induces a pressure on the liver, "disordering its functions" and leading to disease.

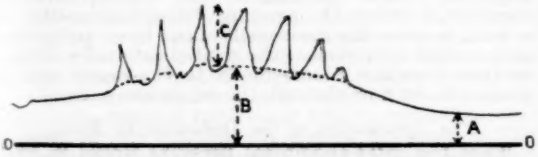
Men state, "as if it were a fact," he said, "that there is great pressure upon the liver and upon the kidney in pregnancy, and proceed to reason upon this, not only to found theories of disease upon it, but also plans of treatment, and all the time they have never given even the slightest good reason for believing that there is any increase of pressure. . . . There is no evidence, but rather to the contrary, that there is any increase of pressure upon the liver or kidney in pregnancy. Indeed, if you turn to the clinical view of the matter and regard cases of large fibrous tumour and of large ovarian dropsies, you will see nothing to confirm the belief that pressure has anything to do with producing disease of the liver or of the kidneys, for in these cases, you might expect far greater pressure than in pregnancy, in consequence of the frequently far greater size of the tumours."[1]

The criticism was accepted by everybody. It nullified all research on the dynamics of the abdomen, a research affecting the whole of internal medicine, and it deviated obstetric thought, qua eclampsia, into a long, devious, and fruitless quest for a primary and specific toxin, which now remained the only possible determinant. Yet the simplest examination serves to show the error of Duncan's view. In my innocence, very many years ago, long before I began my serious academic career, I inserted a rubber bag, filled with water, into the vagina of a woman lately confined. The bag was connected with a long glass tube, which was held vertically, and also contained water. I then caused the woman to rise from her bed, and expected to see the effect of the retentive power of the abdomen. Great was my surprise to see the water shot from the tube to the ceiling. It was clear that during the puerperium, at any rate, and with the change of position from the horizontal to the erect, the retentive power of the abdomen was not manifest. Later examinations with a mercurial manometer of women advanced in pregnancy displayed beyond dispute that the pressure in the rectum, except in some subjects with lax abdominal walls in the knee-chest position, is always greater than the atmospheric, and in most positions is markedly greater. It is perhaps not surprising to find in the erect position in late pregnancy, even with the woman at ease, a raised pressure in the depths of the pelvis, but it is surprising to discover pressure values in this part almost as great when the woman is lying at ease on her back. Even when she has turned on her side and is not straining, the pressure in the rectum, though less than when in the dorsal decubitus, is still greater and often considerably greater than the pressure in the rectum in the non-pregnant woman with flat abdomen in the same position. Such pressures are not consonant with the

[1] Duncan, Matthews: On Hepatic Disease in Gynæcology, Lond. Med. Times and Gazette, 1879, i., 37.

conception that the uterus is aspirated upwards during pregnancy. The reverse is the case. Supported by the pelvic floor, which hypertrophies during pregnancy, the uterus distends upwards, displacing surrounding parts with the force it exerts; these in turn displace outwards and upwards the confining structures, the abdominal wall and thoracic diaphragm, according to their resistance. The greater this resistance the less easy is the uterine expansion and the smaller the child. Clearly, according to this resistance, so must the compression of the intervening viscera—the liver and kidneys vary. When the abdominal walls give way easily the compression may be no more than in the non-pregnant, but if the resistance is considerable, as is usual in primigravidæ and in cases of unduly rapid uterine distension (as in twins, hydramnios, or concealed accidental hæmorrhage), the compression of these viscera can easily become greater than under other conditions.

During labour the pressure within the abdomen must intermittently be greatly raised. The strains of labour differ only in degree from the strains of pregnancy—the strains of running the house, lifting coal, carrying trays, and defæcating. The strains of pregnancy persist throughout several months and are less intense than those of labour. The strains of labour are often great, usually with intervening periods of complete rest, at times of marked fatigue or even exhaustion. During these strains the liver and kidneys must always be greatly compressed. Even Duncan, who computed the force exerted during parturition to expel the child, could not and did not impute this to the uterine activity alone.[2] During the expulsive stage the pressure within the uterus is raised with the uterine contraction, but superadded to this there are elevations of pressure almost equalling



Pressure tracings after de Bruyn (quoted from Bournay, p. 134). The pressure changes within the uterus during an expulsive pain are shown. (A) represents the pressure during the interval between the pains; (B) represents the pressure due to the action of the uterine contraction plus (A); (C) that due to the contraction of the abdominal walls and diaphragm.

those caused by the uterine contraction, due to the contraction of the abdominal parietes, as shown by Bournay's tracing (from an animal) after de Bruyn[3] (see figure).

It was a misfortune for medicine that Duncan's opinion was accepted without question. The men whom Duncan opposed had a very good reason for their belief that the pressure on the liver in some cases is increased in pregnancy and that it causes pathological changes. They knew that puerperal convulsions arise pre-eminently in the most robust and strong primigravidæ. Moreover, Lever[4] (1843) had shown that the abdomen varies in size and figure in different women at the same period of pregnancy, and argued that the pressure caused by the pregnant uterus is not always the same. The condition of the abdominal wall obviously comes into the question; if the abdominal wall is strong and resists the distension, the pressure within the abomen and on all the viscera must be greater than when the abdominal wall is weak and presents a lesser resistance to the distension. The same applies to the thoracic diaphragm. The diaphragm is always pressing down on the epigastric viscera—the pressure in the stomach, in the erect posture, is always positive. Only in enteroptotic states, in which the lower abdomen is so markedly bulged in the erect posture, is the pressure within the stomach negative. In pregnancy, if the abdominal wall persistently resists the uterine distension, the thoracic diaphragm must do more work, must press down on the liver with a greater force, than in the non-pregnant—even during resting states. The diaphragm has to prevent the epigastric viscera from encroaching on the chest; if it did not do this, the blood in the inferior vena cava would not be forced in sufficient amount per unit of time into the right heart and the circulation would cease. Paralysis of the diaphragm, even in the non-pregnant with flat abdomen, is not compatible with life.

Deductions from Evolutionary Studies.

It was, however, a study[5] of the levator ani muscles which led me to appreciate the significance of the intra-abdominal pressure and form the mechanistic conception of eclampsia, which is fundamentally based on evolutionary metabolic deductions. It had been thought that the levator ani muscles in man are simply vestigial structures, representative of tail-moving muscles in tail-bearing ancestors of man. Inquiry showed that this view was altogether untenable; that their essential purpose is to guard the pelvic outlet, acting in many animals as an obturator preventing visceral escape, especially during activity. The only explanation of the flank muscles of the abdomen was (and is) that for some reason they compress the abdominal viscera. The existence of the flank muscles explained the existence of the levator ani. Obviously the flank muscles could not create much pressure within the abdomen if the viscera were not prevented from being extruded from the pelvis. Nor could the abdominal wall contract much if the epigastric viscera were not prevented from entering the chest. Thus, the diaphragm appeared as an antagonist of the abdominal wall, creating with it a positive pressure within the abdomen, and not simply as an antagonist of the thoracic wall participating in the production of a negative intrathoracic pressure. Plainly the negative pressure in the chest and the positive in the abdomen are correlated for some end.

This state of the body, most advanced in man, is but the end of a long progressive change. If one examines the vertebrate series, passing from the amphibia to the mammal, one finds that the pelvic floor advances in structure; that the abdominal wall, in which the flank muscles are early differentiated, increases in strength; that ribs in the head-end of the cœlomic wall develop; and, finally, that the thoracic diaphragm appears and undergoes advancing changes. For what purpose and how did all this occur? Even in amphibia the pressure within the abdomen must be positive. Clearly ribs appeared in pre-reptilian amphibia in order to diminish the pressure within the head-end of the body cavity. Simultaneously the pressure in the caudal end of the body presumably became greater, more positive, because of the concomitant development of the abdominal muscles. The permanence of these changes stabilised the reptiles. Whilst the diminution of pressure anteriorly facilitated the entry of air into the lungs (but not expiration), it also facilitated the entry of blood into the heart. With the appearance of the diaphragm in mammals the epigastric viscera were thrust caudalwards and the mechanism whereby the blood in the abdomen was returned to the heart was enhanced. The output of the heart depends beyond all else on the return of venous blood. Blood cannot pool within the skull or within the limbs as it can within the abdomen; the rise of the intra-abdominal pressure and the concomitant diminishing intra-thoracic pressure throughout the vertebrate series is manifestly correlated with the necessity—at least, with the occurrence—of a progressively increasing circulation.

The improvement in the circulation was correlated with the advance in the manner of living. From the

[2] Duncan, M.: Researches in Obstetrics, 1868.
[3] Bournay: Obstétrique Vétérinaire, second edition, by Rodin, Paris, 1923, p. 134.
[4] Lever: Cases of Puerperal Convulsions with Remarks, Guy's Hosp. Repts., 1843, second series, I., 495.
[5] Paramore, R. H.: The Evolution of the Pelvic Floor in the Non-mammalian Vertebrates and Pronograde Mammals, Hunterian Lectures, THE LANCET, 1910, i., 1393 and 1459.

slowly moving, awkward, and almost clumsy terrestrial amphibian, its body resting for the most part on the ground, we pass to the highly active mammal, so conspicuous for its agility, strength, and grace, its body maintained with ease above the ground. The overcoming of the force of gravity was first made manifest by land life. The fish has its body supported by a medium of like specific gravity to itself. The overcoming of the dreadful fatigue of movement in a medium by which the animal was no longer supported could only have been possible by an increase in metabolic rate. That this occurred is apparent when we compare the warm-bloodedness of the mammal with the cold-blooded state of the pre-mammalian vertebrates. The viscera were obviously involved in the process. In the evolution of the vertebrates we have a progressive advance of the whole visceral machine. Mention has already been made of the advance in structure of the body walls. The viscera also became more efficient, particularly the heart. From a pulsating part of the vascular tube it became a four-chambered organ. As the return of blood to the heart became greater from increase in activity and the necessity of moving faster, the blood required more efficient oxidation; the changes in the heart were presumably determined by increasing peripheral demands. In the endeavour to make new and greater movements the work of the other viscera must have correspondingly augmented. An increased visceral interchange—in the liver, kidneys, and other abdominal organs—must of necessity have come into equilibrium with the establishment of each order.[*]

Thus I came to formulate the wider generalisation that the intra-abdominal pressure is related fundamentally with general metabolism. The greater the intra-abdominal pressure the greater the return of blood to the heart, the cardiac output, and the aortic pressure, unless the peripheral resistance could be more readily overcome. Thus the better is the supply of blood to the brain, to the limbs, to the abdominal viscera; the whole animal becomes more efficient and active. This end was subserved by the development of the skull (the function of which is mainly circulatory), and of the aponeurotic sheaths of muscles (which exist certainly for the same end); the negative pressure in the chest (in virtue of which the pressure of the air in the alveoli becomes operative, compressing the pulmonary capillaries against the thoracic walls, even causing indentations, due to ribs, on the lung surfaces); and the active compression of the viscera in the abdomen. The greater the capillary compression, within limits, the better the blood flow through these channels.

The capillary blood flow is the most important part of the whole circulation and certainly must have become more efficient in the process of evolution, but increased arterial blood pressure alone would not explain this. An increased blood pressure in the arteriole supplying a capillary bed is not the only condition determining an increased blood flow through the capillaries of that bed. It would simply result in a distension of capillaries, a pooling of blood in the capillaries and small veins, and even rupture of these vessels—as occurs in "shock." A compression of the capillaries is necessary for the maintenance of an onward flow and an increased compression, within limits, for an increased flow. Too great a compression of any one capillary bed, however, could easily result in an obliteration of the capillaries and the escape of aortic blood through other channels. If, during evolution, the compression of the abdominal viscera had become persistently too great, a diminished blood flow through the abdominal viscera would have resulted and the blood would have escaped through other parts—through the limbs and the brain. A nice adjustment must have been necessary; only when an adequate resistance in the limbs and the brain had occurred could an increased compression of the abdominal viscera have been tolerated. Conversely, only when a sufficient compression of the abdominal viscera had become possible could an enhanced cerebral blood flow have occurred. When the pre-gibbons began to travel by swinging, using only their arms for locomotion—i.e., when a centrifugal force, plus the effect of gravity, began to play on the blood stream—a great development of the abdominal muscles must have occurred; otherwise the cerebral circulation would have become insufficient for the maintenance of consciousness. The evidence is that the blood flow through the brain became greater than was required for the immediate needs of the animal.

Obviously, too, a nice adjustment between the arterioles and their capillary beds was a necessary condition. The capillaries are thin-walled structures because they thus afford the best means of rapid interchange between the tissue cells and the blood, therefore the pressure of the blood in the capillaries must always be approximately the same as that outside, caused by the activity of the tissue cells or the pressure which these cells transmit to the capillaries through being themselves compressed (as by capsules of organs or by the walls of the abdomen). Whilst the pressure of the blood in the capillaries must be related to the calibre of the supplying arterioles (by which the blood pressure from the aorta is controlled), the converse is also true; the calibre of arterioles is related to the pressure in the capillaries they supply. When the pressure in the capillaries is low, because the tissue cells about the capillaries are inactive or the pressure on them is small, the arterioles supplying these capillaries are correspondingly constricted; when the pressure within the capillaries is high, because the tissue cells about them are active or are more compressed, the related arterioles dilate, so that a greater blood-supply to the organ and a greater blood flow through the organ can occur.

The Application of the Deduction to Man.

Thus the intra-abdominal pressure works in two ways. First, it affects the cardiac output by affecting the volume of blood returned per unit of time; secondly, it affects the capillary blood flow in the abdomen, by compressing the visceral capillaries. The conception that the intra-abdominal pressure is related to general metabolism seems warranted; therefore changes in this pressure, of any duration, should affect general metabolism. Diminution of the average pressure should be associated with diminution of strength and of general activity; increase of the average pressure, within limits, should be associated with increase of strength and capacity for greater work. In practice we find this is so. When the average pressure is low, when the muscles causing it have become weak, signs of general debility occur and the individual becomes neurasthenic or worse. An efficient abdominal support converts this cripple into an active and useful person. In the same way, when a woman with weak abdominal walls becomes pregnant, her whole state tends to improve. When the uterus has begun to bulge the abdominal wall the intra-abdominal pressure rises. More blood per unit of time being sent to the heart, more reaches the brain, the limbs, and the viscera. The capillary pressure in all parts rises, with an improved capillary blood flow. This explains the general improvement in physique and the brighter mentality so often noted as a concomitant of pregnancy. But if the pressure exceeds a certain limit the system must break. Capillaries here and there, and in certain places large tracts, become cut out from the circulation, the blood which should pass through them flowing through paths presenting less resistance. An aberration of metabolism must occur, and pregnancy seems to offer ideal conditions for its production. In the majority of cases, as pregnancy advances the abdominal muscles give way, as is shown by the separation of the recti

[*] In this respect it is interesting to read that in the elasmobranch fish the N.P.N. of the blood "amounts to 1000 mg. per 100 g. of blood, of which about 80 per cent. is urea nitrogen; the tissues likewise contain large amounts of urea. . . . Elimination by way of the kidneys is small, only 20 to 50 mg. of urea nitrogen per kg. being excreted in the urine by the starving dogfish in twenty-four hours." (Dennis: Note on the Tolerance shown by Elasmobranch Fish towards certain Nephrotoxic Agents, Jour. Biol. Chem., 1913–14, xvi., 395.)

in the latter part of pregnancy and by the condition of the abdominal wall after labour. But this is not always so; and in strong, busy, and active primigravidæ a sufficient yielding is especially unlikely. The conception that eclampsia is simply a manifestation of a gravely perverted metabolism, due to an excessive compression, preventing visceral activity, is supported by the facts that the levator ani muscles hypertrophy in pregnancy—particularly in primigravidæ; that the abdominal wall muscles undergo changes indicting the play of an increased tonic contraction (a spasticity, I have called it)[7]; that the pressure in the rectum becomes raised in some cases considerably; and that eclampsia occurs most often in the strongest type of woman, with good abdominal walls.

Those who still believe in the toxæmic origin of eclampsia admit that no direct proof can be advanced, and their indirect arguments are uncertain if not erroneous. Moreover, much positive evidence supporting the mechanistic conception has appeared. Even those who attribute ante-partum eclampsia to a specific toxin have been forced to take count of the visceral state to explain a post-partum eclampsia. But even for ante-partum eclampsia the conception of a primary specific toxin is neither necessary nor warranted. The fact that in eclampsia the liver and kidneys, par excellence, are the organs involved, that degenerative and even necrotic foci are commonly found—conditions so unlike those in really specific toxæmias—e.g., puerperal sepsis—supports the mechanistic conception. The fact that renal and hepatic aberrations usually or even invariably precede the convulsions shows that the visceral disability is primary; whilst the fact that similar aberrations (and lesions) may appear in the non-pregnant shows they are not due to pregnancy per se. Final proof is afforded by the association of the fits with the taking of foodstuffs, only to be explained by the absorption and transit of food products through a liver incapable of sufficient activity and their passage, insufficiently changed, into the systemic blood. A dog with an Eck's fistula develops convulsions although no poison is given with the food; nor in the healthy, active, busy, robust pregnant woman—the one that eclampsia especially selects—can it be believed that any specific toxin is in play.

[7] Intra-abdominal Pressure in Pregnancy, Proc. Roy. Soc. Med., Obst. and Gyn. Sec., 1913, vi., 291.

Clinical and Laboratory Notes.

NOTES ON CANCER OF THE STOMACH.

By GEORGE VILVANDRÉ, M.R.C.S. ENG.,
ASSISTANT RADIOLOGIST, LONDON HOSPITAL.

THE following remarks are based on experience extending over many years and embracing numerous cases of carcinoma of the stomach. The outstanding fact in the great majority of cases examined by X rays or seen at operation has been the widespread extension. As a rule, patients have come late for radio-diagnosis which, in my opinion, is second to none in the investigation of this disease. What has also impressed me has been the failure, sometimes of great clinicians, to give a definite diagnosis, even in advanced cancer of the stomach. This is not meant to reflect on their ability, but rather to point out the insidiousness of the malady, or the lack of symptoms pointing to a definite organ. One man of florid countenance with the appearance of full health and only complaining of a little indigestion was found, upon X ray examination, to have extensive and what proved to be inoperable malignant disease of the stomach. On the other hand, the picture of a thin woman, obviously losing weight and strength, anæmic and anorexic, failed to reveal to the clinician the true nature of her disease, even though occult blood was present in the stools. When X rayed, extensive carcinoma of the lower two-thirds of the stomach was found. Three years previously she had been diagnosed as suffering from "gastritis." The radiological examination strongly suggested that a penetrating ulcer had been the starting-point. A diagnosis of "gastritis" should only be made when all other possibilities have been excluded, especially in a patient over 45.

When no obstruction is present either at the cardiac end of the stomach or (as is more common) at the pyloric end, the symptoms are much more insidious. So long as the lumen of the stomach is patent, the patient is unlikely to show diagnostic symptoms. In most cases, to look for vomiting as a sign of gastric carcinoma is to wait in vain. The pars pylorica is usually involved in primary cancer, but the pylorus itself is not necessarily involved or obstructed. In my experience, pyloric obstruction has been present only in a small proportion of cases, and I have probably seen more pyloric obstruction in non-malignant ulcer than in carcinoma. Pain has been frequent, but its absence has been noted in well-established cases. Loss of appetite has been a more frequent symptom than any other, and carcinoma has been found in practically every case where there has been aversion from food. I have heard a surgeon state that because a man had no loss of appetite he could not have carcinoma of the stomach. This is going too far, for to wait for such a state of affairs is often to wait until the case is inoperable.

The most important and early sign in the X ray examination is the loss of peristaltic waves in a certain portion of the stomach, more often in the pars pylorica. "Half shadows" come later. Peristalsis ceases at the point where muscular is replaced by neoplasmic tissue. As the growth increases, the local contour of the stomach becomes abnormal. The replacement of the smooth curved contours of muscular viscera, like the stomach, by sharper lines or irregularities, however small, is one of the first diagnostic signs. This was well illustrated in one of my cases where a very slight defect was pointed out, but operation was postponed because the clinical picture was not really that of carcinoma. Some three months later the patient was X rayed again when I could confirm my previous findings more definitely. Operation was performed and a small carcinoma was found in the pars pylorica.

The Importance of Early Laparotomy.

Sometimes the clinical picture and the X ray evidence are those of comparatively restricted carcinoma, but on operation extensive secondary deposits are found studded over the liver, and post mortem this organ, together with the omentum and the peritoneum in the pelvis, may be widely infiltrated. To see such cases in the post-mortem room of a hospital makes one wonder whether some of the advocates of radium for the treatment of gastric carcinoma visit that department. The surgeon at least has a chance of a good look round and can estimate better than anyone the value of partial gastrectomy in a given case. An extensive case of carcinoma may appear inoperable under X rays because of its size and its position in the upper half of the stomach. Laparotomy, however, is in my opinion the only way of determining whether an extensive operation is possible or not. One case in particular justified it. Radiologically the case was inoperable. The patient, a medical man, begged Mr. Walton to give him a chance and take the risks and, although a large carcinoma was present, the patient wrote he was quite well a year later.

Neoplasms vary in their virulence and spread, and X rays can only show their size. Whilst the diagnosis of carcinoma can be made with certainty by X rays in a large proportion of cases, the majority of these will be neoplasms independent of a previous gastric ulcer. For some years it has been pointed out by Moynihan, Sherren, Walton and others that carcinoma may supervene upon a chronic gastric ulcer. This may

escape the naked-eye diagnosis of the surgeon, who may only find an ulcer, but sections of the excised portions may be found microscopically to show cancer cells. On the other hand, the operator may find definite evidence of malignant changes at the ulcer or glands on the small curvature. Clinically and radiologically, however, the picture may be only that of a chronic ulcer. The size of the ulcer is no criterion of its malignancy or innocence. Under X rays I have several times seen penetrating ulcers the size of half-a-crown or bigger, which have at operation and subsequent section proved to be benign, whereas smaller ulcers have been malignant. In none of these cases has X rays indicated anything but the presence of a penetrating ulcer, sometimes fixed to surrounding structures such as the pancreas or liver. The clinical evidence of the presence of cancer was not in any of these cases reliable. There is therefore, in my opinion, serious danger in the purely medical treatment of gastric ulcers. What may be wise medicinal treatment in a patient of 25 or 30 may mean disaster in an older one, whereas a timely laparotomy might show an early carcinoma on an old ulcer fit for excision. Carcinoma of the stomach in my series has occurred as early as the twenty-fifth year and the X ray findings were ultimately verified in the post-mortem room. Of the unfortunate patients who have carcinoma the less unfortunate are those whose pylorus is involved early, because they present definite symptoms. Repeated vomiting cannot very well be ignored, for when it is not relieved the patient usually seeks further advice.

Earlier Diagnosis Possible.

Carcinoma of the stomach appears to-day to be a dread disease and often fatal, but I am confident that, even allowing for the insidiousness of many cases, the greater proportion should not go so long undiagnosed. It has been written that no case of indigestion in a patient over 40 lasting more than three weeks or so should be allowed to go uninvestigated, and if this were better known and adhered to fewer mistakes would be made. Recently I have seen a woman who was in a hospital for six weeks and was sent out with the diagnosis of gastritis or possible duodenal lesion, and yet no test-meal had been given. Fourteen days after discharge from the hospital she had a well-marked carcinoma of the stomach.

The so-called "leather bottle" stomach, where the cancer cells are few and where gradual but very extensive fibrosis is present besides the neoplasm, appears to go longer undiagnosed than most. This is probably due to the lack of severe pain, the absence of bleeding, and the ready passage of the food through what looks under X rays like a rigid tube. On the screen the meal can be seen pouring from œsophagus to duodenum without a stop, but the lumen of the stomach is narrow and often irregular. The absence of peristalsis may be complete, for the muscular coat may be entirely replaced by neoplasmic and fibrous tissue. Most of these patients come too late for operation. There were a few, however, where this condition was localised at the pyloric end. In these, the X ray appearance may suggest syphilis of the stomach, which is rare in this country; a man may have a positive Wassermann and carcinoma of the stomach. The contention may be advanced that a filling defect of the stomach will be interpreted under X rays as carcinoma whether it be a malignant new growth, a polypus, or an adenoma. Although the differential diagnosis may not be made in the X ray room, the end-result should be the same—namely, laparotomy. In my student days we had impressed upon us the necessity of palpating the left supraclavicular fossa where a secondary gland might be found. Obviously this is a late sign, meaning that advanced lymphatic invasion has taken place, and X rays should avoid such a delay.

High gastric carcinoma may give rise to suspicion of œsophageal disease because of the symptoms of obstruction, but gastric pain is usually in the epigastrium, whereas œsophageal disease at the lower end of the tube gives mid-sternal pain, and a carcinoma of the œsophagus at the level of the bronchus gives rise to pain at the level of the manubrium sterni or higher. Spasm at the lower end of the œsophagus may be caused by an ulcer high up on the small curvature, whether benign or malignant, and no condition of œsophageal spasm should be considered completely investigated without examination of the small curvature. Carcinoma is not so much incurable as undiagnosed, and many more cures would be possible were the condition investigated earlier. It is the little signs that count, such as the rather indefinite indigestion in a patient over 40. In two patients in whom laparotomy was performed and inoperable cancer was found, together with numerous secondaries in the peritoneum, marked temporary improvement took place and the patients lived a year, one comfortably for most of that time.

NOTE ON THE REMOVAL OF ADENOMATA OF THE RECTUM.

By H. H. GREENWOOD, M.B. LOND., F.R.C.S. ENG.,
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ACCORDING to Yeomans,[1] adenomata of the intestinal tract occur most frequently in the rectum, ileum, colon, ileocæcal valve, and duodenum. The subject has recently been reviewed by Lockhart-Mummery [2] in his presidential address to the Proctological Section of the Royal Society of Medicine. The tendency to malignant change in these apparently innocent growths, even when appearing as solitary tumours, lends them a sinister significance. In all situations save in the rectum, excision of the affected portion of bowel wall is done logically and without hesitation, in the hope of anticipating any tendency to local spread. In the rectum proper simple snaring or ligation of the pedicle with excision by the anal route [2 3 4] is usually advocated and practised. For those tumours situated at a high level, Lockhart-Mummery advises excision of the coccyx and the laying open of the rectum from behind to gain full access. Unless, however, a margin of healthy bowel is taken with the tumour, these measures seem to be inadequate, and to disregard the known tendency to malignant change. When an adenoma is found lying on the anterior wall of the rectum above the level of the reflection of the peritoneum at the bottom of Douglas's pouch—that is, at any distance greater than 4 in. from the anus—removal

FIG. 1.

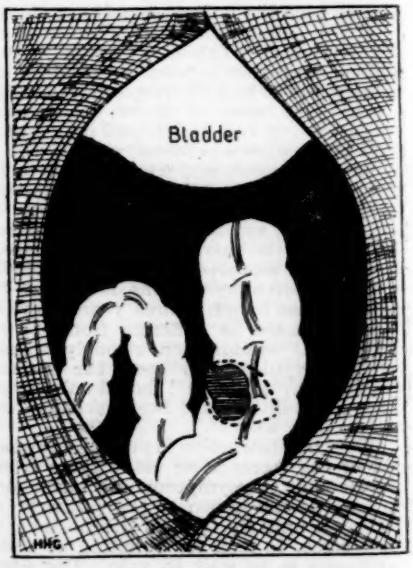


Diagram showing position of tumour in pelvis. On the left is a loop of pelvic colon; the dotted line indicates the line of section around the tumour; and above this the rectum is seen descending in relation to the bladder.

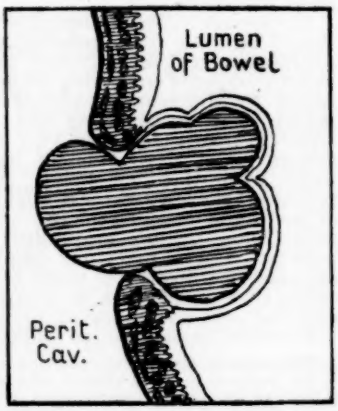
even by simple ligature and excision is not altogether free from the risk of opening the peritoneal cavity and inviting consequent infection by leakage.

Myomata develop in the same submucous layer as do adenomata, and while they usually grow towards the lumen of the bowel, they sometimes tend to grow outwards and to invade the peritoneal cavity.[5] In like manner an adenoma, solitary and showing neither gross nor microscopic sign of malignancy, can refuse to follow the line of apparently least resistance towards the lumen of the rectum, but may project, uncovered by peritoneum, into the peritoneal cavity.

I can find no record in the literature of any case resembling the following, which exemplifies the possibility of an innocent adenoma violating the integrity of the peritoneal covering of the bowel.

A man, aged 24, who was referred to me by Dr. W. Binning, complained of constipation, the passage of small quantities of blood in the stools and tenesmus—a feeling of incompleteness and aching pain in the rectum after defæcation. Curiously enough, a definite history of these symptoms only extended over the preceding five or six weeks. With the sigmoidoscope a sessile tumour could be seen bulging into and almost occluding the lumen of the pelvic colon about 8 in. from the anus. The broad base and flat domed shape of the tumour precluded any attempt at snaring or any other manœuvre which might pull on the bowel wall and so involve the risk of dragging down a pouch of peritoneum.

FIG. 2.



Diagrammatic drawing of a longitudinal section of the tumour, showing the mucous membrane, the muscular layer of the gut, and the peritoneum. A groove is seen around the tumour, which is uncovered by peritoneum.

On June 9th, 1928, the abdomen was opened and the tumour, bright red in colour and about the size of a walnut, was found projecting from the left antero-lateral wall of the pelvic colon. The bowel wall ended abruptly at the edge of the growth, around which was a shallow gutter (see Fig. 2). After snipping round the edges, the tumour came away readily, leaving a large oblique hole in the wall of the bowel. Trimming the margins of the wound caused a hemisection of the bowel, which was closed by three layers of fine catgut sutures. To safeguard against leakage a cæcostomy was done; a large rubber tube was passed up from the anus until the end reached a point 2 in. beyond the suture line, and a small drain leading down to the pelvic floor was left in the lower angle of the abdominal wound.

The rectal tube remained in situ for six days; the cæcostomy closed at the end of a fortnight, by which time the abdominal wound was soundly healed. Inspection and palpation of the rectum and sigmoid revealed no other tumour, nor could any other growth be seen later through the sigmoidoscope. The patient is now free from symptoms.

The pathologist's report shows that the tumour is a simple adenoma, free from any sign of malignancy, and *that over the part exposed in Douglas's pouch there is no trace of peritoneal covering.* It seems clear that removal by the anal route, or even by the more precise method of excision after division of the posterior wall of the rectum, would have left a large gap which, even if recognised, would have proved difficult to close securely.

A case has recently been reported by Gordon-Watson,[6] in which he opened the abdomen to gain access to a tumour situated just beyond reach of the sigmoidoscope, some 12 in. from the anus; by pushing down the tumour from above it was possible to seize it from below by the anal route and to remove it. I venture to suggest that removal of these solitary growths situated above the level of the peritoneal reflection should always be preceded by laparotomy and that a margin of healthy bowel should be excised with the tumour if there be any evidence of involvement of the peritoneal covering. The risks attending resection, provided that an adequate peritoneal toilet be observed, appear to be less than those incurred by the approach from within the bowel. If the growth in this case attained its peculiar position by invasion of the wall, it would appear to have done so by virtue of a nascent malignancy too subtle to be betrayed by gross cellular changes.

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AN UNUSUAL RESULT FOLLOWING INJECTION TREATMENT OF VARICES.

BY F. REYNOLDS, M.B. MANCH.

THE following case may be of interest:—

A woman, aged 25 years, commenced treatment in May, 1928, and, according to my custom, attended once weekly for injections of quinine urethane solution. Two injections were given each week, and the patient was discharged in June. The vein under treatment was the external saphenous, which was markedly varicose from ankle to knee. By the end of June the whole vein was obviously thrombosed by the injections, and the patient was asked to return in eight weeks time in order that I could inspect the result.

She returned in September, and to my surprise I discovered that in place of the now obliterated vein was a remarkable overgrowth of hair which exactly followed in each curve the line of the original vein. The hair differed in two respects from the natural hair of the legs: in the first place it was both longer and denser; and, secondly, it was decidedly darker in colour, so much so that the patient suggested that she should shave her leg in future.

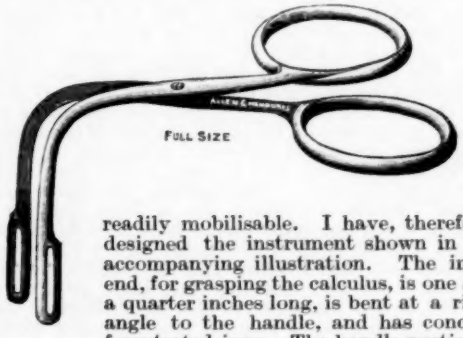
Although I have carried out over 500 injections this year this is the first time I have observed such an occurrence.

Manchester.

New Inventions.

PYELOLITHOTOMY FORCEPS.

WHEN removing calculi through an incision in the renal pelvis, I have often found difficulty in manipulating the ordinary type of forceps, especially if the patient is stout, the pedicle short, and the kidney not



readily mobilisable. I have, therefore, designed the instrument shown in the accompanying illustration. The inner end, for grasping the calculus, is one and a quarter inches long, is bent at a right angle to the handle, and has concave fenestrated jaws. The handle portion is two and a half inches in length. With such an instrument one can work in a much more limited space than with a straight or nearly straight type.

The instrument has been made for me by Messrs. Allen and Hanburys, Ltd., of Wigmore-street, London, W.1.

W. K. IRWIN, F.R.C.S. Edin.

THE PANEL CONFERENCE.

MEDICAL CERTIFICATES OF INCAPACITY.

THE annual conference of representatives of local medical and panel committees was held on Oct. 25th at the House of the British Medical Association, with Dr. E. K. LE FLEMING in the chair. On the report of the Insurance Acts Committee (I.A.C.) an important discussion arose on

Excessive Sickness Benefit Claims.

Dr. H. G. DAIN (chairman, I.A.C.) said it was very serious that after 15 years of National Health Insurance there was a continuing rise in the number of claims for sickness benefit. As the people primarily responsible for certification, panel practitioners naturally came in for criticism by outside bodies. To everyone else concerned in working the scheme it was an attractive theory that medical men were to blame for the increase; even the Minister of Health and his officials had implied in their speeches that the fault lay largely with those who issued the certificates, whilst at every conference of the approved societies responsible people got up and made charges against the medical profession. It was certainly extraordinary that the claims should have risen so greatly in the absence of epidemics or any general increase in morbidity, but the Ministry now agreed that the first cause of the rise was not defective certification, and Sir Walter Kinnear in his public statements placed it quite low down on the list of causes. The I.A.C. had made it clear to officials of the big approved societies that it was anxious to help in reducing the number of claims, provided they on their part agreed to speak temperately about the medical profession. It was wrong that the public should be constantly told that it was the fault of panel practitioners; on the other hand, the latter must be sure their conduct gave no ground for the allegations. There was undoubtedly a varying standard of incapacity in the minds of medical men, and Dr. Dain hoped the conference would agree that steps should be taken to review the certification of those whose standards were unduly low. It was impossible except at great cost to collect the certificates issued by a particular doctor, but the credit of the profession would be improved if machinery were available for ascertaining and dealing with exceptional cases. As a result of conversation between representatives of the I.A.C., the approved societies, and the Ministry, certain proposals had been made, and he was about to recommend them to the conference.

Dr. G. A. RORIE proposed an amendment by Dundee, "that the conference doubts the advisability of the I.A.C. taking any initiative in forming such proposals, but is willing to consider any suggestions made by the Minister." In support of this Dr. GORDON WARD urged that it was no part of the I.A.C.'s duties to pull chestnuts out of the fire for the Ministry. Approval of the proposals would be taken as admission of the need for tightening up certification, a need which most panel practitioners did not admit.—Dr. W. COOK also thought the charges of excessive certification were greatly exaggerated. He put down part of the increase of sickness claims to extensive epidemics of catarrh of the nose, throat, and tonsils, giving rise in their turn to an increase of rheumatism. Accidents due to motor vehicles accounted for a large number of claims, whilst the employment of women in industry caused a great deal of ill-health. Many of the men who had lost their livelihood in the coalfields were so short of food and clothing that their vitality was lowered, and it was quite proper to certify that some of them were unfit to perform their ordinary work.—Dr. B. E. A. BATT was willing and anxious to support the I.A.C. in any inquiry helping to prove that there was no excessive certification, but was not prepared to support proposals for a new disciplinary procedure.

Dr. DAIN replied that the profession was not asked to admit the facts; the facts were patent. Not in any particular district, area, or type of practice, but all over the country, there were a few doctors who were giving unnecessary certificates. The I.A.C. had taken no initiative, but had been asked to discuss with the Ministry on equal terms what should be done to prevent this from happening. For the most part the proposed changes could be set in motion by the Ministry, whether practitioners liked them or not, but he thought the profession ought to play a constructive part if possible.

This view was accepted by the conference, which defeated the Dundee amendment by a large majority and passed on to consider the I.A.C.'s recommendations in detail.

The Suggested Procedure.

The first of the new proposals is designed to prevent a patient from changing his doctor without the knowledge of his approved society, and lays it down that on "accepting an insured person on to his list during an illness which has rendered that person incapable of work," a practitioner shall issue a new first certificate. This principle was approved without much discussion.

The second recommendation is "that arrangements should be made for numbering certificate books, or certificates, or both, supplied to each practitioner, with the object of comparing the numbers of certificates issued by different practitioners within the same period." In commending this proposal, Dr. DAIN admitted that it did not go very far; different practitioners might have different uses for certification forms when they got them. Nevertheless over a period of, say, five years it might give a useful idea of the way in which certificates were being issued, and might show up any grave discrepancies. If there were two doctors practising side by side in the same area and one used three times as many forms as the other, there might then be a case for inquiry.—This proposal also was approved by a large majority.

The third motion ran as follows:—

> That records should be compiled of the references made to the regional medical officers, and of their results, in such a form as will enable comparisons to be made from time to time of the results of the references of patients of each practitioner and of the general body of practitioners whose patients are examined at the same examination centre.

Here again Dr. DAIN pointed out that the Ministry could carry out this proposal if it liked without reference to the wishes of the conference. At certain centres, in fact, the scheme had been working for some time, and experience showed that in each area there were two or three doctors whose referred patients were generally fit for work over long periods. Such a state of things seemed to be ground for further consideration, bearing in mind the nature of the particular practice, the general health of the area, and the percentage of aged people attended. The results of any comparisons would be communicated to the panel committees, and there was no suggestion that these matters should be laid before bodies with lay representation.—The motion was passed after it had been amended by addition of the words "always provided that no additional clerical work be imposed upon the panel doctor in this connexion."

Disciplinary Action in Cases of Excessive Certification.

The fourth resolution proposed by the I.A.C. led to a more brisk debate. In its final form it ran:—

> That a procedure should be established by which the number and nature of the certificates issued by a practitioner may, in suitable cases, be made the subject of: (*a*) an interview between the practitioner and a regional medical officer; (*b*) consideration and report by the Panel Committee; and (*c*) further action in any case in which it appears to the Panel Committee that the issue of certificates by the practitioner has been improper.

Dr. DAIN admitted that this was further disciplinary machinery and as such was objectionable. It must be remembered, however, that the need for such machinery was inherent in the system by which practitioners had a right to go on or off the panel as they wished. Any medical man could join the panel to-day, and this freedom was unwelcome to some of the approved

societies who were anxious to tighten up the machinery. The alternative was that the Ministry or the societies should choose their own doctors, or appoint only people working for them, and a proposal had even been made that special certifying doctors should be appointed under the Act. One of the penalties of going on or off the panel was that practitioners must submit to discipline and new machinery was essential if the present system was to be maintained. The new procedure was, of course, not intended to affect the present plan, by which complaints by approved societies about certification by a practitioner were referred for investigation by the medical service subcommittee, but it had the advantage that those who considered the case—i.e., the regional medical officer and the panel committee—would all be medical men. The committee would have the alternatives of recommending the Ministry: (*a*) that no case of lax certification had been made out; (*b*) that no action be taken for six months; (*c*) that a fine be inflicted; or (*d*) that the case should be investigated further by a committee of inquiry or should be referred to the General Medical Council.

Dr. S. A. WINSTANLEY proposed a Lancashire amendment to the effect that the existing machinery dealt adequately with any cases of irregular certification and instructing the I.A.C. to "resist the introduction of any further procedure, the result of which might be to harass those practitioners whose certificates do not approximately conform in number with the average in his or any other area." The insurance practitioner was accustomed, he said, to the Ministry's insistence that the practice of medicine and the treatment of disease must be reduced to a bare average, and it was now a recognised form of heresy to exceed that average. But avoidance of the heresy led the practitioner into the greater sin of false doctoring, and he feared that worse was to follow when not only treatment but also diagnosis and prognosis came under that law.

Dr. G. G. GENGE objected to the panel committee being placed in a punitive position, thus being turned from a friend into an enemy. What was wrong with the present regulations? He thought it unlikely that anything would prevent the Ministry from overriding the panel committee's decision and prosecuting in a medical service subcommittee.

Dr. DAIN refused to admit that insurance practice was governed by the law of averages, but he believed a man who did his work properly and gave what he thought necessary would probably find that his practice was surprisingly near the normal. If there was punitive work to be done he preferred that it should be done by a medical man.

The Lancashire amendment was lost by a large majority and the I.A.C.'s recommendation was approved on the understanding that new procedure would not come into force until after the next panel conference.

On a motion "that a single form should be introduced to replace the different forms now used to notify insured persons that they are referred to regional medical officers either (*a*) by approved societies or (*b*) by practitioners," Dr. DAIN said that at present there were two forms and the patient knew whether he was being referred by the society or by his doctor. The result was that the doctor rarely referred him, and the object of the resolution was to make it easier for the medical man to refer the patient without the latter's knowledge. The motion was carried.

Excessive Prescribing: Signed Statements by Practitioners.

When excessive prescribing is alleged there may be an interview between the regional medical officer and the practitioner concerned. Dr. DAIN said he had always regarded this as a confidential heart-to-heart talk, but doctors were now being asked to sign statements describing what had taken place. The reason was that regional medical officers differed in their methods, so that the Ministry must insist on a report, and if a report was to be any good the Ministry must know whether it would be accepted by the practitioner. The latter was expected not only to make any corrections which seemed desirable, but also to amplify the statement as he thought fit, the object being to get the best explanations which he felt himself able to offer. On seeing such a statement the Minister would sometimes say that no further proceedings were necessary. This would be an advantage. On the other hand, once signed, the statement became a piece of evidence that would be produced at the panel committee's hearing. There were many members of the profession who would sign a statement about their own actions without a sufficient sense of responsibility; there were others without an appreciation of the meaning of words; and the scheme had the undoubted disadvantage that such people might make their position worse.

Dr. E. JOHNSTONE, for Manchester, proposed an amendment recommending that insurance practitioners be advised not to sign any statements of this kind. There were men in Manchester, he said, who would sign almost anything, and the whole business was designed to trip up the doctor.—Dr. J. D. WELLS held that the weaker brethren must be protected.—Dr. F. RADCLIFFE thought there was nothing to be gained by signing statements, as it did not matter how many cases went to the panel committees. It was a particularly unfortunate moment for the Ministry's suggestion to be made when the newspapers were full of accounts of similar inquiries designed to get statements out of a flustered defendant before prosecution.—Dr. H. S. BEADLES said that no two men would write the same account of a conversation, yet probably the practitioner would content himself with altering only a word or two here and there.

Dr. H. W. POOLER inquired what view the defence societies would take of these signed statements, to which Dr. H. B. BRACKENBURY replied that members of these societies could ask their advice before signature.—Dr. H. J. CARDALE objected to the suggestion that the intelligence of the profession was so low that medical men could not read statements, alter sentences, or get the opinion of a defence society or panel committee.—Dr. C. EDE thought the difficulty might be got over if statements were only signed on the advice of the member of the panel committee who attended the interview, but this suggestion was not accepted by the Manchester spokesman, who persisted in his amendment. It was lost by a considerable majority, Dr. DAIN having summed up in favour of the Ministry's proposals.

Dr. GORDON WARD, for Kent, proposed an amendment including the suggestion that the regional medical officer after the interview should "report only that the disciplinary procedure is or is not in his opinion necessary." Dr. Ward thought he should confine his attention to the question whether there was a prima facie case for investigation.—Dr. DAIN opposed this amendment because he thought it would be very dangerous to leave the decision in the sole hands of regional medical officers, whose outlook was very variable. In some areas every practitioner would be sent to the panel committee, in others none.—Dr. WARD replied that a decision by a known regional medical officer was preferable to a decision by an unknown official at the Ministry; the regional officer, moreover, would come in for censure if on the one hand he exceeded his duties or on the other hand failed to carry them out.

The view of the Insurance Acts Committee, that signed statements were desirable, was accepted by the conference.

Approval was also given to the following motion by Birkenhead:—

That panel committees be recommended to furnish, at least once per annum, the following information to each practitioner on the local panel: (*a*) the average prescription cost in the area; (*b*) the highest average prescription of a doctor in the area (no name); (*c*) the lowest average prescription cost in the area (no name); (*d*) the average prescription cost of the practitioner to whom the above information is supplied.

Testing the Quantity and Quality of Drugs.

In 1926 the Panel Conference agreed that practitioners should furnish, if required, a prescription for the purpose of a test of the drugs and appliances supplied under the Insurance Act. On a paragraph on this subject in the I.A.C.'s report for 1927–28 Dr. L. J. PICTON, for Cheshire, suggested that a better scheme for testing drugs might be devised on the analogy of the system of inspection under the Food and Drugs Acts. It had been shown four years ago, he said, that two guineas was a minimal fee for the analysis of sample prescriptions, and to save money the Ministry had now adopted a system by which practitioners were asked to write fictitious prescriptions of simple mixtures in order that a large number could be analysed at the same time. He regarded this scheme as inefficient, for it often warned the chemist of what was intended, and he disapproved of medical men being forced to do work which was ethically distasteful to many of them.

Dr. E. LEWYS-LLOYD pointed out that analysts under the Food and Drugs Acts were asked to examine single substances, never mixtures. It would be quite impossible to examine insurance prescriptions on the same plan without great expenditure.

Dr. J. H. MARSH said that in signing these fictitious prescriptions under compulsion practitioners were helping to police the pharmacists. They were almost being turned into agents provocateurs, and he feared that with the extension of insurance benefits—e.g., to nursing—this principle also might be extended. Many drugs prescribed by panel practitioners came under the Food and Drugs Acts, and this ought to be a sufficient protection to patients.

Dr. DAIN said that the duty had been undertaken at the request of the chemists themselves, who had agreed with the Ministry that these were suitable steps to ensure that prescriptions were properly dispensed.

The Cheshire amendment was lost by a large majority.

The Nature of Medicine.

The I.A.C.'s report states that the Minister of Health holds that the question whether a particular substance is in a particular case a drug or a medicine within the meaning of the Act is generally one for legal decision. He is, however, prepared to issue some guidance about the means whereby an insurance committee can reach a decision on this subject, and the I.A.C. proposes to send to panel committees a list of preparations which in its opinion should ordinarily not be looked on as medicines.

Dr. A. FORBES, for Sheffield, moved that the I.A.C. be asked to reconsider its decision to issue such a list. In the first place, he said, there should not be a list at all; for the practitioner should be left to use his own judgment about what was necessary for his patient. In the second place there should not be the particular list which the committee had drafted; it contained the names, for instance, of various preparations containing vitamin A, which might be of great value.

Dr. DAIN said that if it could be agreed that certain substances were foods rather than medicine it would save the doctor possible expense and would be a guide to the chemist. He undertook that the list should be carefully scrutinised and that any specific objections would be considered.

The Sheffield proposal was vetoed by the conference, which proceeded, on the motion of Kent, to reaffirm its opinion "that the nature of financial arrangements now made with pharmacists is contrary to public policy." Dr. DAIN reported the progress that had been made with production of a National Formulary.

Change of Panel Doctor.

On a motion by Kent that "a fair trial of the 14 days' delay in change of doctor has shown it to be productive of hardships and difficulty without compensating advantages," Dr. DAIN urged that no opinion should be formed on this subject without further experience. In his own area the new system had reduced by about a quarter the number of patients who changed their doctor without changing their address. Some of the approved societies were pressing for a reversion to the 6-months or 12-months period, but the medical profession stood for the principle of the free choice of doctor.—The conference decided not to debate the subject further at present.

Misconduct of Agents of Approved Societies.

Dr. W. COOK said that whilst insured persons and the agents of approved societies could make complaints against practitioners, there were no means by which the latter, in his turn, could make complaints against them. In a case in Warwickshire reference to the Ministry had failed to stop an incriminated official from going on gaily with his work. He asked the conference to reaffirm its decision of 1926, that this small meed of elementary justice should be granted to insurance practitioners.

Dr. DAIN said the matter was not as simple as it sounded. The doctor could be brought before a medical service subcommittee because he was employed by an insurance committee, whereas the agents of approved societies were employed only by those societies. But the Ministry, by its new powers of withholding money for the administration of the societies, had gained a certain amount of power over their administrative machinery, and any complaint supported by evidence would certainly be dealt with.

Contract Rate for Juvenile Oddfellows.

Dr. J. NELSON, for Kingston-on-Hull, proposed that—

> In the opinion of this conference the I.A.C. should not have given its approval to the recommendation of the Council of the British Medical Association to the Annual Representative meeting, that contract practice for juveniles should be accepted at a less rate than that obtaining under the National Health Insurance Acts, inasmuch as (*a*) it had not ascertained the views of the Panel Conference, representing all panel practitioners, and (*b*) the acceptance of such lower rate would be likely to have a prejudicial effect in any future negotiations that may take place regarding the capitation fee under the N.H.I. Acts.

He said that as the payment to be made for attendance upon juveniles did not come under the National Health Insurance Acts, it might be regarded as nothing to do with the Panel Conference. But if that was so, then the I.A.C. should not have expressed an opinion upon it. The question was one of principle. No form of contract practice should be accepted at anything lower than the National Health Insurance rate, and he believed that acceptance of the Manchester Oddfellows' offer of 8*s.* 8*d.* would prejudice the position when the question of a capitation fee for dependents came up for consideration. The profession had never accepted the 9*s.* capitation fee under the Acts as adequate, and when payment was again reviewed it would be regrettable if the I.A.C. should be able to say it had a mandate to accept 8*s.* 8*d.*

Dr. E. A. GREGG protested against the acceptance of the lower standard. In the London Medical Service, which had 10,000 members, the doctor received a clear 13*s.* for each patient.

Dr. J. W. BONE described the motion as a vote of censure. Did the conference think the I.A.C. should have refused to give its opinion on this matter of urgency? Everyone who had negotiated the present capitation rates was a member of the I.A.C., which was indisputably a committee of experts, and this Committee had agreed that the acceptance of 8*s.* 8*d.* would not be damaging in future negotiations and that, all things considered, it was the equivalent of the National Health Insurance fees. The incidence of illness was lower among children aged 3 to 16—or even from birth to 16—than it was amongst panel patients, who remained under treatment until they died. The London Medical Service was negligible in size, and the big medical services of the country did not on the average receive as much as 8*s.* 8*d.* In his own town the fee paid for juvenile Oddfellows was

5s. and the average for the country as a whole was between 6s. and 7s.

Dr. H. W. POOLER feared that the proposed rate would not be remunerative in a country practice where mileage had to be considered.—Dr. CARDALE thought the agreement would do great harm in future negotiations. A better position for individual practitioners in certain parts of the country should not be gained at the expense of the general interests of the profession. It would be an argument in favour of the proposal if children were really less trouble than adults, but he had always found his children's clubs particularly burdensome. Dr. JAMES HOLMES agreed that juvenile practice was harder than anything else, whilst Dr. A. BRADSHAW said that in Smethwick the local position had been made worse by the fact that the Council of the British Medical Association had approved the Oddfellows' offer.

Dr. BEADLES regarded 8s. 8d. as a considerable advance on what was being paid at the present time.—Dr. J. G. MCCUTCHEON believed that it was as much as could be got at present. In some parts of the country doctors were attending miners and their families at an inclusive rate of 15s. per annum, and work for juveniles was being done at 4s. 4d. Children might be more liable to disease than adults, but many now went to hospitals for infectious diseases, others came under the care of the public health and education authorities, whilst an immense number of babies went to child welfare centres.—Dr. R. FORBES also supported the I.A.C.'s action on the ground that it would raise the standard for the country as a whole, and Dr. BRACKENBURY said that if he had to conduct the negotiations for a capitation fee over again he would consider himself in a stronger position if a fee of 8s. 8d. had been obtained. He regarded it as comparable to 9s. under National Health Insurance or 13s. under a public service.

Dr. W. PALMER, supporting the motion for London, pointed out that no income limit was laid down for the family. The arrangements would be under the control of a friendly society and against a scheme of this kind the profession had always set its face.

Kingston-on-Hull's motion was ultimately carried by 69 votes to 50.

Miscellaneous Topics.

Among other subjects discussed was medical benefit for seamen, and it was agreed that the I.A.C. should continue its efforts to secure that the Seamen's National Insurance Society should be placed on the same basis with regard to medical benefit as other approved societies.

Swansea brought forward a resolution suggesting that a scheme should be formulated whereby pathological investigations might be undertaken where there were no existing facilities.—Dr. DAIN explained that there was no hope of carrying out such a scheme until after the next valuation. The question was, however, referred to the I.A.C.

Dr. E. K. LE FLEMING was unanimously re-elected chairman for the coming year.

NEW TORBAY HOSPITAL.—This hospital will be opened at 2.30 P.M. on Saturday, Nov. 17th, by Lord Mildmay of Flete.

CHADWICK PUBLIC LECTURES.—Of the series of lectures now being given under the Chadwick Trust the next is to be on the London Water Supply, and will be delivered by Mr. H. E. Stilgoe, M.Inst.C.E., at the Institution of Civil Engineers, Great George-street, London, on Monday, Nov. 12th, at 8 P.M. On Wednesday, Nov. 21st, at 5.15 P.M., at the Medical Society of London, 11, Chandos-street, W., Dr. E. P. Cumberbatch will speak on Physiotherapy, with special reference to medical electricity, and on the following day, at 8 P.M., he will give an address on the same subject at the Guildhall, Bath. At University College, Exeter, at 7.30 P.M., on Monday, the 26th, Dr. P. B. Ballard will speak on Open-air Schools; and at 6.30 P.M. on Tuesday, Dec. 4th, Mr. Henry C. Adams, M.Inst.C.E., will lecture at the Royal Sanitary Institute, London, on the Drainage of Basements and Low-lying Areas and the Prevention of Damp.

Reviews and Notices of Books.

NELSON LOOSE LEAF LIVING SURGERY.

Edited by ALLEN O. WHIPPLE and FORDYCE B. ST. JOHN. Vols. V. and VI. New York: Thomas Nelson and Sons. 1928.

IN each new issue this loose leaf surgery maintains the standard set by the earlier volumes. In Vol. V. the editor-in-chief (Allen Whipple) writes the section on surgery of the biliary tract. This is a scholarly exposition of the subject; particularly we like the author's account of the surgery of injury to the bile-ducts, and his frank summing up of what can and cannot be expected from operative treatment. The section on the surgery of the spleen, by Eugene H. Pool and Ralph G. Stillmann, also deserves special mention. The different conditions of the spleen amenable to surgical treatment are as simply and clearly described as contemporary knowledge permits. The surgery of the rectum and anus is allocated to Vernon C. David and Daniel C. Jones jointly; that of the pancreas is described by John Speese; of the appendix by Roger T. Vaughan; and of the stomach by A. J. Walton, one of the few English surgeons taking part in this great work. His contribution admirably expresses the views of a large group of surgeons. There is also a section by J. A. Blake on diseases of the peritoneum.

Vol. VI., when all its constituent sections have appeared, will be a complete treatise on urology written by a number of contributors, amongst whom such well-known names as Hugh H. Young, Frank Hinman, William Quinby, and William Frontz may be mentioned. Young has supplied a splendid chapter on diseases of the prostate, whilst Hinman's account of urological functional pathology is highly instructive. A final chapter is devoted to laboratory urology and experimental work. The conception of such a chapter is good, but to be of real service it would have to be much amplified.

Both these volumes could be criticised on points of detail. There is a misprint in Vol. VI. (p. 118, line 2), where hydrocele has been substituted for varicocele. Some of the subjects, notably urology, seem to have been cut up too much and distributed amongst an unnecessarily large number of authors. Again, some readers may not be in agreement with certain of the opinions expressed. But on the whole opposing views have been very fairly presented and the consistent excellence of the volumes is remarkable.

GYNÆCOLOGY FOR STUDENTS AND PRACTITIONERS.

Third edition. By THOMAS WATTS EDEN, M.D., C.M., F.R.C.P., F.R.C.S., Consulting Obstetric Physician, Charing Cross Hospital and Queen Charlotte's Maternity Hospital; and CUTHBERT LOCKYER, M.D., B.S., F.R.C.S., F.R.C.P., Consulting Obstetric Physician, Charing Cross Hospital; Consulting Surgeon, Samaritan Free Hospital for Women. London: J. and A. Churchill. 1928. Pp. 822. 36s.

IN the third edition of this well-known text-book the authors have made an effort to reduce its size without omitting anything of importance. By using slightly larger pages it has been found possible to provide a volume containing 102 fewer pages than its predecessor. Among general text-books of gynæcology for the student and for the practitioner, there is none better in the English language. The book is complete and yet does not confuse the reader with innumerable theories and methods of treatment which are often of doubtful value. Nor have the authors gone to the other extreme by stressing unduly their personal views. There is one disappointing section, the meagre account of the treatment of cancer of the cervix by radium. During the past

two or three years, results have been published which compare favourably with those obtained by the most experienced operators. Whether irradiation will replace the radical operation or no is still doubtful, but a more detailed account of the methods which have achieved success might have been included. The technique described in this book has proved ineffective as a curative measure in the past and the dosage represents a fraction of that considered to be essential by those with great experience in the use of radium for cancer of the cervix. The chapter on adenomyoma has been rewritten as the result of recent work on the nature of ovarian blood cysts. The pathology of the condition is explained as simply as possible and several excellent illustrations are supplied. Some of the recent work on the anatomy and physiology of menstruation is described, but discussion of such controversial subjects as the internal secretions of the ovary has wisely been avoided. Whatever may the importance of these substances in the gynæcology of the future, their value as therapeutic agents is at present practically unknown.

The section on operative gynæcology has been revised, particularly with regard to the treatment of fibroids and uterine displacements. There is a useful page of illustrations to show the methods of removing fibroids in different situations through a single anterior incision.

The edition is well produced and illustrated and will doubtless maintain the popularity of this standard work.

THE STRUGGLES OF MALE ADOLESCENCE.

By C. STANFORD READ, M.D. Lond., Lecturer in Psychological Medicine, Royal Bethlem Hospital; Medical Psychologist to the West End Hospital for Nervous Diseases. London: George Allen and Unwin. 1928. Pp. 247. 7*s.* 6*d.*

Dr. Stanford Read, whilst not claiming originality for this book, has used his own practical experiences to apply psycho-analytical principles to the study of the many unfavourable variations in the mental development of the male child. He admits a tendency to the direct inheritance of parental mental traits, but claims for modern psychology that with its help we can study and learn to avert maladjustments that have hitherto been too readily ascribed to heredity. The subject is adequately handled; in fact, the parent desirous of avoiding pitfalls, for whom the book is written, may become alarmed at the manifold ways in which he can come to grief in the training of his son. Dr. Read avoids one pitfall himself, skilfully enough, by offering little positive advice; he follows the safer plan of stating what errors are commonly committed, and his aim is so to educate and inform the parent that injurious influences may be eliminated, rather than to advise him in the direction of active interference The book may be recommended to medical men who desire an introduction to psycho-analytical views and their relation to the problem of adapting the child to social demands.

INDEX PSYCHOANALYTICUS, 1893–1926.

Compiled by JOHN RICKMAN, M.A., M.D., Hon. Sec., Institute of Psycho-analysis, London. London: Hogarth Press. 1928. Pp. 276. 18*s.*

IN the compilation of this Index Dr. Rickman has surveyed not only that literature, voluminous in itself, in which psycho-analytical principles are enunciated by recognised authorities, chiefly in the journals and library series devoted to psycho-analysis, but papers and books intended by the authors to be on psycho-analysis. He also provides references to many publications that have a bearing upon the subject, whether that is indicated by their titles or not. A search for isolated papers suggest that few English writers have escaped notice, whilst Continental and American publications seem to have been documented with equal care. Writings antagonistic to psycho-analysis have not been ignored, but the list of works of Alfred Adler ends at the year 1918, and familiarity with recent developments leads us to infer that Dr. Rickman considers his later writings to have no connexion with psycho-analysis. Since inclusion in the Index bears with it no stamp of approval, it is an advantage that references are given to reviews in the psycho-analytical journals. German, Austrian, and Hungarian contributions form the largest group, American and English are next in number; there is a small group of Swiss writers, but the Latin countries are scarcely represented at all. The names of over eleven hundred authors appear, and apart from its usefulness as a guide the book is a skeleton history of the development of this important subject. Our curiosity is stimulated by an isolated and untranslated sentence in Magyar at the end of the index.

POLIOMYELITIS.

By W. RUSSELL MACAUSLAND, M.D., Surgeon-in-Chief, Orthopædic Department, Carney Hospital, Boston. Philadelphia: Lea and Febiger. Pp. 402. $5·50.

IN this book the author has presented a general survey of poliomyelitis in its various aspects, with a more detailed account of the surgical treatment of its late results. In the earlier chapters, which deal with ætiology and epidemiology, and in the account of the general treatment of the acute stage, a comprehensive review is given of the publications of numerous authorities, the author maintaining an open mind on many of the questions under discussion. He gives a qualified support to the combined intravenous and intrathecal administration of human convalescent serum, though he recognises the doubt as to whether it ever comes into contact with the virus. The symptomatology and differential diagnosis of the acute stage are admirably described, and a clear idea is given of the assistance obtained from examination of the cerebro-spinal fluid at different stages of illness, and of its limitations.

The greater part of the book is devoted to the methods of avoiding deformities in the paralytic stage, and to the operative treatment of those which have occurred as residua. The text is profusely illustrated, and sufficient detail is given to enable the practitioner to deal with any combination of lesions which he is likely to meet. When discussing some of the general therapeutic measures used in the restoration of muscle power the author attributes little value to electrical stimulation, but is convinced of the efficacy of heliotherapy.

This book should be of considerable utility as an up-to-date summary of our knowledge of poliomyelitis, and as a book of reference.

ACUTE OTITIS AS A DISEASE OF CHILDHOOD.

Die akute Mittelohrentzündung. By Dr. ADOLF FR. HECHT, Privatdocent for Children's Diseases at the University of Vienna. Vienna: Julius Springer. 1928. Pp. 126. M.7·80.

THIS little book is not intended to give a description of inflammation of the middle ear from an otological standpoint, or to provide any account of the clinical aspect of this condition; it aims rather to discuss the incidence of the disease from an epidemiological point of view. A painstaking attempt has been made, with the assistance of numerous statistical tables, to show the frequency of otitis and its age and sex incidence in the various infectious fevers and in several other conditions such as tuberculosis, stomatitis, tonsillar and retro-pharyngeal abscess. Other tables show the stage of disease at which this complication occurs; thus the cases complicating measles are divided into four groups according to their incidence respectively in the prodromal stage, before the eruption, at the defervescence, and after

involution of the exanthem. Although the criticism may be made that the numbers of cases recorded are not sufficiently large to afford an adequate basis for drawing conclusions, the studies included in this book will be of interest to physicians, epidemiologists, and otologists.

HANDBOOK OF SANITARY LAW.

Tenth edition. By B. BURNETT HAM, M.D., D.P.H. London: H. K. Lewis and Co., Ltd. 1928. Pp. 284. 6*s*. 6*d*.

Dr. Burnett Ham's Handbook of Sanitary Law, mainly designed for the use of candidates for public health qualifications, has reached its tenth edition, and, as before, will be found a useful compendium. When the author first produced it in 1899 he commented on the frequency with which public health legislation had been amended. The law is now more confused than ever, and he does good service in calling for a consolidation of the various groups of statutes; it is an administrative scandal that health officers have to delve in the strata of the successive deposits of amendments under which the Public Health Act of 1875 lies buried. Dr. Ham's pages refer to the excellent consolidations of housing and town-planning law which were passed in 1925, but he does not appear to give Parliament credit for similar measures elsewhere. The consolidation of the Food and Drugs Acts took place too recently for his book to notice it; the law, of course, is correctly stated, but the statutes are now repealed and replaced. He might, however, have made it clear that the National Health Insurance and Workmen's Compensation Acts were similarly superseded in 1924 and 1925 respectively. It is a pity to print the 1913 classification of mental deficiency without a warning that it was changed in 1927, or to allude to Part II. of the Mining Industry Act (Pit Committees) which never took effect. In the chapter on the notification of infectious disease it might be noted that the 1919 Regulations (pneumonia, malaria, dysentery, trench fever, &c.) were superseded a year ago. These criticisms illustrate the difficulties of an author who tries to keep pace with the latest Parliamentary and departmental output. One source of help is the Chronological Index of the Statutes, an expensive annual publication issued by H.M. Stationery Office, wherein the latest changes affecting Acts of Parliament are officially recorded with such fidelity as human fallibility permits. Dr. Ham's handbook could hardly be expected to show every minor amendment and extension of the law. Within its own limits it contains a mass of information, and the candidate who masters it need fear no examiners.

EYE DISEASES IN GENERAL PRACTICE.

Die Behandlung der Augenkrankheiten in der Allgemeinpraxis. By Dr. KURT STEINDORFF. Leipzig: Georg Thieme. 1928. With 18 figures. Pp. 124. M. 5.80.

THIS little book is nothing if not practical. It deals with the treatment of those affections of the eye which are bound to come in the way of every practitioner, and leaves practically untouched all that is more wisely left to the ophthalmic specialist. The opening section discusses drugs, summarising well the relative advantages of cocaine and its substitutes, and dealing in the same way with atropine, eserin, adrenalin, and the silver salts and their substitutes. This is knowledge which every practitioner should possess, and the section is well up to date, even mentioning that glaucosan may be useful in an emergency. The technique of local anæsthesia is described; the therapeutic application of heat and cold to the eye; bandaging; and the specific treatment of syphilitic and tuberculous affections, as well as non-specific therapy by injections of milk. The second part of the book is chiefly devoted to the treatment of common affections of the lids, conjunctivæ, and corneæ, diseases of the deeper parts of the eye being dealt with more summarily. Clear instruction is given as to the cases which the general practitioner cannot be expected to deal with except in consultation with a specialist; these include all operative cases, except minor operations, and all fundus diseases. As to refractive errors the general practitioner is counselled to undertake the correction of none but simple cases. It would be well, however, to emphasise more than is done in this book the danger of leaving untreated cases of squint in young children, for this is a matter with which the practitioner is pre-eminently concerned.

TONSILS AND ADENOIDS AND THEIR DISEASES.

By IRWIN MOORE, M.B., C.M. Edin., late Surgeon to the London Throat Hospital, and to the Hospital for Diseases of the Throat, Golden-square. London: William Heinemann, Ltd. 1928. Pp. 395. 21*s*.

Mr. Irwin Moore has here given us an interesting series of essays on affections of the faucial tonsils, with a chapter on the lingual tonsil and another on the nasopharyngeal tonsil or adenoids. Each chapter is followed by a copious bibliography, and the opinions of numerous authorities are quoted in the text, so copiously indeed in some places as to obscure Mr. Moore's own views. An interesting, though somewhat rare condition, bony and cartilaginous formations in the tonsils, is treated exhaustively, and with the wealth of reference to authority which have given such value to Mr. Moore's previous essays on obscure subjects in laryngology. Similar references are provided for other rare conditions, including uncommon varieties of benign tonsillar tumours. On the other hand, malignant disease of the tonsil is dealt with in a cursory manner; its treatment by operation, as well as by radium and X rays, is barely mentioned. The author is at his best in his detailed description of the methods of tonsillectomy by guillotine and by dissection, though his recommendation of a 4 per cent. solution of cocaine in 1 in 2000 adrenalin for injection to produce local anæsthesia must be considered a dangerous one, and we also take exception to his statement referring to general anæsthetics that the chief cause of death has been too light an anæsthesia, which allowed blood to be inspired. A full description is included of the treatment of enlarged tonsils by caustic soda and lime, introduced by Morell Mackenzie, and revived by Mr. Moore. He is surely overstating the position when he maintains that there is no after-pain with this method, but he is careful to note that this form of treatment cannot be expected to replace surgical removal in the ordinary run of cases. The book is not intended to be a systematic text-book on the tonsils, but is full of interesting matter, and is well illustrated.

BOOKS FOR NURSES.

Handbook on Venereal Diseases. For Nurses and others engaged in the Routine Treatment of these Diseases. By W. TURNER WARWICK, F.R.C.S., Assistant Surgeon and Medical Officer in Charge of Male Gonorrhœa Department, Middlesex Hospital. London: Faber and Gwyer, Ltd. 1928. Pp. 221. 6*s*.

A BOOK on venereal diseases for nurses, midwives, and health visitors has been needed for some time. The modern technique in the treatment of venereal diseases is here dealt with very thoroughly, and if the book is to some degree over the head of all but the keenest nurses employed in V.D. clinics, it will be found most useful by medical students and general practitioners, as well as by clinic sisters. Mr. Turner Warwick provides in condensed form an excellent idea of the most modern treatment of the venereal diseases, and almost entirely avoids contentious and theoretical matter. His book will therefore please the practitioner who wants to keep abreast with the latest methods and not to be worried with controversies.

The chapter on the duties of a nurse towards patients with venereal disease is really admirable.

A Text-book of Orthopædic Surgery for Nurses. By PHILIP LEWIN, M.D., F.A.C.S., Associate Professor of Orthopædic Surgery, Northwestern University Medical School, Chicago. London and Philadelphia: W. B. Saunders Company. 1928. Pp. 353. 15*s*.

WE are not sure that the need for special text-books on surgery for the use of nurses has been proved to exist, but granted that there is such a want, Prof. Lewin is well fitted to supply it. Any nurse who wishes to go beyond her own work, and to enter into the problems of diagnosis and the choice of methods of treatment in orthopædic cases, might be better advised to consult the larger text-books, where she would find adequate descriptions of some conditions which are barely mentioned in this book. The brief chapters in Prof. Lewin's book which more nearly concern nurses, such as that on the use of plaster-of-Paris, will be found of great practical value.

GOOD HEALTH, GOOD PARENTHOOD, GOOD COOKING.

How to Enjoy Health: Counsels and Maxims for the Healthy Life. By CLAUDE LILLINGSTON, M.D., Editor of the *World's Health;* and NORAH HILL, A.R.R.C., Assistant Editor. With Preface by Sir SQUIRE SPRIGGE, M.D., Editor of THE LANCET. London: Hodder and Stoughton. 1928. Pp. 287. 2*s*. 6*d*.

On Being a Father. By K. M. and E. M. WALKER. With an Introduction by CECIL DELISLE BURNS. Illustrated by VIOLET M. GUY. London: Jonathan Cape. 1928. Pp. 192. 5*s*.

Prudence and Peter: A Story for Children about Cooking Out-of-doors and Indoors. By ELIZABETH ROBINS and OCTAVIA WILBERFORCE, M.R.C.S., L.R.C.P. London: Ernest Benn, Ltd. 1928. Pp. 208. 7*s*. 6*d*.

THREE books which have reached us within the last month have as a very high common factor the circumstance that they are each the product of a doctor writing in collaboration with a laywoman. The unusual quality of all three may be mere coincidence, but it induces a reflection that in this joint authorship may perhaps lie the secret of preparing popular books on general and special hygiene, infection and disinfection, the biochemistry of the kitchen, the phenomena of fertilisation and childbirth—in fact on all those subjects associated with the body and its functions on which the public is greedy for clear and accurate information.

It is stated in the author's preface to one of them that Dr. Lillingston has verified Miss Hill's facts, while she has curbed any tendency on his part to indulge in technicalities and scientific jargon. The result is a mixed bag of stimulating essays on subjects ranging from fleas to drug addiction, from constipation to maternal mortality, from the treatment of persons found unconscious to the choice of a career. None of the essays contains more than about 1500 words, most of them considerably less. There is not a redundant word throughout the book, but in spite of being pithy the essays are whimsical, easy to read, and full of grace. The authors review with light touch many of the problems which have been the subject of serious debate in scientific circles during the last few years. Their work is entirely free from those dogmatic assertions which irritate the informed, and yet the reader is led to a definite point of view. If, as is implied, these notes are reprinted from articles on health and preventive medicine contributed to different Red Cross journals, we must urge the authors to continue writing them and to collect and publish further evidence of their flair for interesting the layman in the preservation of his health. If it is not ungrateful to criticise such an admirable production, we may express doubt whether a modern alienist would agree that the hysteric and the neurasthenic are true borderline cases; at any rate, the fate of untreated sufferers from the neuroses is not sufficiently established to make it desirable to say much about it in a handbook which may be read by many whose nervous condition is unstable.

Mr. and Mrs. Kenneth Walker have divided their book into two parts, of which the former instructs the expectant father as to the facts known about fertilisation, heredity, fertility, birth control, pregnancy, and childbirth. In the first chapter, on animal fathers, the authors contrast the happy-go-lucky habits of most insects, where the fathers take parental responsibilities lightly, with those of bees, wasps, and ants, whose young are cared for on methodical lines well in keeping with the rest of their well-ordered lives. Notes on fatherhood among reptiles, birds, and mammals lead up to a sympathetic review of the paternal instinct, its development and its limitations. Succeeding chapters deal with subjects which have only recently become drawing-room topics, and may again be banished in a less outspoken age. Mr. and Mrs. Walker handle them with such a delicate touch that no one could fairly criticise either their matter or their taste. The question posed by Mr. A. P. Herbert—"What do the ladies talk about when the ladies leave the table?"—reminds us that during this century the white slave traffic, venereal disease, psycho-analysis, birth control, and homosexuality have succeeded one another as fascinating mysteries whose attractions varied inversely with the ignorance of the conversers. It is informative books like the one under review, written with a fine sense of values, which relieve the processes and problems of reproduction and the phenomena of sex of a murky significance, and establish knowledge of them as part of the philosophy which every adult has to acquire. When such problems are considered seriously in a scientific treatise quite without affective tone, the average reader will find them dull and will prefer to live in a world of piquant guesses. If they are treated with sickly emotion, as in so many popular works, the more educated layman is merely disgusted by the sentimentality. Mr. and Mrs. Walker have a sense of the grave responsibilities of fatherhood, actual and potential, tempered with the gay conviction of happy parents that life and its transmission can be and should be good fun. The second part of the book gives directly practical advice to established rather than expectant fathers, consisting of wise hints on companionship, the growth of fear, early training, the swing of the pendulum against stern disciplinary methods, and story-telling. The illustrations are delightful.

Prudence and Peter have a simpler mission. They are twins of 12 who have a taste for good food as well as for adventure. They make friends with the family cook, an artist who exacts stern discipline from her pupils, but in return for serious attention gives of her best; and her best is a collection of recipes (set out in an appendix), and a continuous flow of practical advice on the theory and practice of the preparation of foodstuffs. Not that her dishes are elaborate; the scene is laid in a country house in war time, and the climax is a dinner for a General home from the front, cooked by the twins under the watchful eye of Mrs. Barber, whose sprained ankle has forced her into a passive rôle. There is no limit to the appeal this book should make, or to the age, sex, or social position of those who would welcome it as a Christmas present. We have tried some of the original recipes and found them good. The most delicious (and the only extravagant one in the book) is *crême brûlée*. It is also the most difficult to bring off, and for the less skilled the addition of another egg and the substitution of more cream for milk is advisable. The name of Miss Elizabeth Robins as joint author with Dr. Wilberforce is sufficient indication that the technique whereby instruction is woven into the charming sketch of family life is a joy in itself.

THE LANCET.

LONDON: SATURDAY, NOVEMBER 3, 1928.

THE PANEL PRACTITIONER'S DUTY.

THE last few years have seen an alarming increase of claims for sick-pay under the National Health Insurance Acts, and as every claim hangs on a medical certificate the first impulse of all concerned has been to lay the whole blame on the doctor who has to sign it. We trust that this impulse, after two years' vigorous expression, has now worked itself out leaving minds ready to think of causes other than the carelessness, self-seeking, or sentimental pliability of our profession. Dr. DAIN told the Panel Conference last week that leading officials of approved societies have agreed to speak more temperately than has been their custom of late, whilst the Ministry of Health long ago ceased to look on faulty certification as the principal cause of this drainage on insurance funds. No one can really believe that the profession has suddenly changed its standards or lost its feeling of responsibility. As things stand the temptation to be complaisant is certainly very present to many a panel practitioner, but we have a right to assume that the other explanations of the rise in sickness-rates will not be overlooked. Times have been hard, and industrial upheavals have impaired the livelihood of hundreds of thousands of working men. Malnutrition of body and mind has lighted up the ailments of many who would take work if they could get it; moreover, the average age of insured persons is rising, and they are more and more aware of the benefits due in return for payment under the Acts. It may be true that there have lately been no widespread epidemics, nor any general rise of morbidity, but an increase has been noted not only in the sickness claims on National Health Insurance funds but also in claims on insurance societies and companies whose members come from a wealthier stratum of the community. Lastly, as the Insurance Acts Committee suggests, there may have been some mistake in the original calculation of the amount of sickness and disablement benefit that would be needed. The three quinquennial periods since the Act came into force have been covered by the war, the boom that followed it, and the subsequent depression, and "it is a little difficult," as the Committee remarks, "to understand how a normal standard as regards the amount of sickness and disablement has been arrived at."

When all this has been said, the painful facts remain to be faced. It is a delusion to suppose that the funds of the approved societies, because they are large, are inexhaustible. They have no supernatural inlet, like the widow's cruse or the drinking-cup of Thor, and on close examination the balance of £42,000,000 at the last valuation justifies no more than a slight extension of the scope of national insurance. Rightly enough, Sir ALFRED WATSON and his colleagues have agreed that only £27,000,000 of the surplus shall be distributed during the present five years, and over £18,000,000 of this will be absorbed in additions to the statutory money benefit. That leaves less than £9,000,000 for additional benefit in other forms, or something like 3*s*. 7*d*. a year for each insured person. Clearly this does not go very far towards setting up the specialist and hospital services that ought to be developed from the Acts. Far from being inexhaustible, the funds are little more than sufficient for the elemental needs of the huge population they serve, and the distribution, during one year, of a week's extra benefit to every person on the sick-roll would mean the abandonment of a specialist service and the collapse of the scheme for additional benefits. In reporting that there was a reasonable expectation of these benefits continuing, Sir ALFRED said that they would only do so if a high standard of administration was maintained by the approved societies, if there were no unfavourable visitations such as the industrial crisis of 1925–26, and if the full coöperation of the medical profession with regard to sickness claims could be ensured.

The National Health Insurance funds may be likened to the water in a cistern which supplies a thirsty population of 13,500,000. At present the cistern is fairly full, but the people outside are demanding more and more drinks. One way of dealing with the situation is to educate them to a sense of responsibility, to make it clear that there is only a certain amount of water, and that if they do not use it carefully there may not be enough later on. In an ideal community this caution would be sufficient, but here in England it is essential to see that water is strictly withheld from those who do not need it. Panel practitioners are in the unenviable position of being the taps through which it is distributed, and there is not the least doubt that a few of these taps work much too easily so that there is always a crowd round them to profit by the flow of sickness certificates. The system is faulty because the practitioner is paid according to the size of the crowd he collects, and because the patient moves off to another tap if he encounters any stiffness or opposition. The first fault, which is inherent in the whole scheme of panel practice, is largely neutralised by the traditions of the profession; the second has been limited to a certain extent by the new plan under which a patient cannot change his doctor without a fortnight's notice. The principle of free choice of medical advice is very important and should be kept as far as possible, though the wisdom of the choice must ultimately depend upon the enlightenment of the insured population. This enlightenment is growing and though the panel practitioner may be conscious of opposition between his interests and his duty, we believe that a correct attitude will pay him in the long run. To maintain such an attitude can never be very easy, even for the most altruistic, since he is called upon to hold a delicate balance between the welfare of his patients and that of the community. Therefore there will always be individual differences in practice and the authorities would be unwise to insist on bare invariable averages. On the other hand, it is regrettable that the failure of a few individuals to make reasonable efforts should prejudice the position of the profession, and we believe that practitioners in general will welcome the new arrangements for ascertaining and checking excessive certification, as approved by the Panel Conference. They are set out in our report on p. 920, and here we need only mention the inconspicuous fact that the conference also arranged better facilities for referring a troublesome patient to a regional medical officer. Some extension of the

disciplinary machinery of the Acts is unfortunately foreshadowed in the proposals, but as Dr. DAIN pointed out, this machinery is the price paid by the profession in return for freedom to go on and off the panel at will. Some of the alternatives advocated, such as the appointment of special certifying doctors, or the direct employment of practitioners by approved societies or by the Ministry, would be even more objectionable. The present system is so nearly ideal in so many ways that it is well worth preserving, and in considering the differing views and suggestions of those who would like to change it, we feel that panel practitioners should congratulate themselves on being represented by such men as Dr. DAIN and his colleagues. If the service is to develop usefully it can only be by the labours of those who combine clear sight with a strong sense of the responsibilities of the profession.

THE CHARACTERISTICS OF HYPOCHONDRIA.

ONE use of the classification of diseases is to put our own conceptions into ordered form and to compel attention to the significance of words that, without an occasional survey of our ideas, may come to possess very different meanings for different people. Hypochondria belongs to the name-group that includes melancholia and hysteria and it has survived in our terminology perhaps because, by the divorce between etymological meaning and clinical application, it has lent itself to the expression of views that, by the nature of the subject, could not easily be expressed in a word of definite diagnostic or symptomatic significance. This has, however, resulted in such a loose use of the word and its derivatives that clarification has become necessary. Hypochondria has been confused with hysteria and neurasthenia; a patient who is "sorry for himself" is called hypochondriacal, whilst at the other extreme we find that psychiatrists recognise a hypochondriacal melancholia or even paranoia. Thanks to modern psychopathology, our conception of hysteria is becoming more definite than it was, and from neurasthenia have been separated the anxiety and obsessional states, which are capable of clinical differentiation and differ from each other in their pathology and readiness of cure, a small group of cases of unified type being all that is left to which the term neurasthenia may be usefully applied. The time has obviously come for a consideration of the position of hypochondria, and Dr. R. D. GILLESPIE opened a discussion on that subject on Oct. 23rd at the Royal Society of Medicine, as reported in our last issue. He took up the position, not unknown in general medicine, that although in mental disorders there are no diseases, only diseased people, yet it is convenient and useful to put cases into groups so that we can easily sum up our ideas regarding such matters as ætiology, treatment, and prognosis. Recent work as Pinsent-Darwin research student at Cambridge University leads him to believe that there is a type of case, admittedly rare, in which exists a symptom-complex with well-defined characters and that this type of case can be classified as hypochondria. The patient shows a persistent preoccupation concerning bodily health in excess of what would be justified by any physical disturbance that happens to be present, with an emotional attitude best described as interest with conviction, anxiety (in the sense of a fearful apprehension of disease) being absent. The absence of anxiety is, it may be deduced, an important diagnostic criterion and should exclude those cases in which a continued emotional state produces visceral disturbances upon which the attention of the patient and others may be wrongly fixed; cardiac and digestive troubles of this nature are to be recognised by the concomitant symptoms of pathological anxiety, which exclude them from Dr. GILLESPIE's category. He excluded visceroptosis with a mental fixation upon abdominal symptoms, and it may be noted that some psychopathologists believe that visceroptosis itself may be the result of a continued asthenic emotional state. Hypochondria he places upon the intellectual rather than the emotional level, the only emotion being that attached to certainty of belief. It differs essentially from hysteria in that it serves no secondary purpose; the hypochondriac does not use his disease to influence his environment, and except for his insistence upon treatment and upon operations it interferes little with happiness. One speaker, indeed, frankly advised letting the patient alone in his happy preoccupations. Dr. GILLESPIE agreed with FREUD's observation that the hypochondriac shows the character traits of orderliness, parsimony, and obstinacy, and noted that the absence of psycho-analytical views about ætiology was due to the inaccessibility of the patient to analytical procedure. This inaccessibility, which is related to an insusceptibility to the influence of reassurance, marks off the condition from the psychoneuroses, which are called transference neuroses by FREUD because of the ease in setting up that relationship with physician or analyst which permits of suggestive influence or analytical therapy. There seems to be a deep alteration of personality which implies a relationship with the major psychoses, an implication strengthened by the occurrence of hypochondria as an early symptom in dementia præcox, although it is characteristic of typical hypochondria that it is not accompanied by intellectual or emotional deterioration. The characteristics of this form of mental disorder seem to preclude satisfactory treatment when once gross organic disease has been proved absent; the best we can do for the patient is to save him from quacks and protect him from his own insistence upon operations; but in spite of—indeed, because of—this unsatisfactory conclusion, it is the more necessary that recognition of the disorder should be made certain and that our conception of it should be made clear. The paper and subsequent discussion have greatly helped in that direction.

PUBLIC HEALTH AND LOCAL GOVERNMENT.

THE Second Report of the Royal Commission on Local Government [1] covers, amongst other matters, two principles discussed in our columns last week in connexion with Sir GEORGE NEWMAN'S annual review of the state of public health—namely, the organisation of local government in larger units, and the concentration of all health services in one administrative unit in each area. Some of the figures submitted to the Commission by the Ministry of Health were striking. Last year there were 66 boroughs, 302 urban districts, and 126 rural districts with a population of 5000 or less; in the large majority of these a penny rate produces less than £100. It is no reflection upon the zeal and capacity of the members and officials of these bodies to say that their standards of public health service must suffer if their financial resources are so limited. Nobody desires to strike a blow at an institution so national and characteristic as local self-government in England, nor to sap the confidence of the ratepayers in their elected representatives;

[1] Cmd. 3213. H.M. Stationery Office. 1s. 6d.

but a too parochial organisation is unsuited to modern conditions. In the provision of isolation hospitals, for example, there is undoubtedly a shortage of accommodation which may not unfairly be called a public danger; many county districts are admittedly quite unsuited either in respect of population or finance to provide and maintain their own hospital; much has been done by joint action, but the progress in this direction is merely a proof that the local government unit for this purpose is too small.

The present system of allocating health functions between the various local authorities can in certain instances be criticised as arbitrary, illogical, and uneconomic, though any plan for redistributing those functions must be careful not to disparage the work and irritate the temper of the members of local bodies who have given their services with so much public spirit in the past. The Notification of Births Acts may be selected as one such instance. These statutes do not merely exist for the compilation of statistics; they should ensure that the occurrence of a birth attracts the attention of the local authority responsible for maternity and child welfare arrangements. Yet there are areas where the working of the Notification of Births Acts is in the hands of local bodies which are not the bodies responsible for maternity and child welfare. The urban district council may be the authority for school medical service and maternity and child welfare work, while the county council is the "local supervising authority" under the Midwives Acts. Up to the birth of the child, therefore, the urban district council is entrusted with the welfare of the mother and the unborn child. At birth the midwife takes charge and the responsibility for supervision passes to the county council for a brief period. Eventually the urban district council resumes control in its capacity of school medical authority, but meanwhile there has been a break in the continuity of supervision. County councils, and not district councils, are, in the great majority of county districts, the local authority for the purposes of the Midwives Acts and for maternity and child welfare. Yet the Public Health (Ophthalmia Neonatorum) Regulations direct the attendant practitioner to notify first the medical officer of health for the county district wherein the case has occurred; the county medical officer is merely entitled to a copy of the notice within the next 24 hours.

The reshuffling of functions is naturally no easy matter. It would, for example, be dangerous to tamper with existing arrangements for school medical services because it would mean reopening questions of responsibility for elementary education which were none too easily settled in 1902. The Royal Commission's recommendations are sensible and discreet. It proposes that the 1902 arrangement be left undisturbed; that school medical authorities not now responsible for maternity and child welfare work should be empowered to represent to the Minister of Health that they should undertake that responsibility; and that county councils should be empowered to represent to the Minister that maternity and child welfare authorities which are not local education authorities should hand over their maternity and child welfare work to the local education authority. This transfer, it is recommended, should be made possible by an order of the Minister. As regards the Notification of Births Acts it is recommended that the authority responsible for working those Acts should be obliged to send forthwith a duplicate notification to the local maternity and child welfare authority. Here the Minister had suggested that the same authority should exercise both functions, but the Royal Commission hesitates to go quite so far. Its proposals as to the Midwives Acts are as follows: the maternity and child welfare authorities, if they employ a whole-time medical officer, should be empowered to represent to the Minister that they should be constituted "local supervising authorities" under those Acts; before he makes an order to that effect, the Minister, it is suggested, should have regard to the size, equipment, and resources (including the provision for training midwives) of the applicant unit; county councils, it is further proposed, should be empowered to represent to the Minister at any time that on administrative grounds the duties of a local supervising authority under the Midwives Acts should be retransferred to themselves. As to the ascertainment and treatment of ophthalmia neonatorum it is recommended that the responsibility be assigned to a single authority in each area—namely, the authority for maternity and child welfare; and it is proposed that notifications should go in the first instance to the local authority which gives the treatment, whether or not it is also the "local supervising authority." The report shows an appreciation throughout of the need of the power to stimulate a backward authority and to deal with default. The county council, it is suggested, should have the duty of seeing that adequate provision exists for isolation hospitals in the county; it should draw up a scheme in conference with all local authorities concerned, and, if it is satisfied that provision in any area is inadequate or ill-arranged, it is to frame proposals for reorganisation or rearrangement subject to a right of appeal by a local authority to the Minister. Small-pox hospitals are apparently regarded as capable of differentiation from other infectious diseases hospitals. The Commission recommends that the task of providing and maintaining them be given to the county councils, but that existing arrangements, where satisfactory, should not be disturbed.

From these recommendations it will be seen that the Royal Commission generally favours elasticity rather than rigidity. The countryside will have some say in the rearrangement of its local government; it is not to be the victim of a Parliamentary Procrustes. Other matters worth study will be found in the Second Report—proposals, for instance, for large-scale water-supply and sewerage where there is a common interest in such services. One final point may be mentioned in conclusion, a point already raised in Sir GEORGE NEWMAN'S recent summary. The Royal Commission definitely approves, wherever possible, the appointment of whole-time medical officers of health, and the progressive acceleration of such appointments whenever individual vacancies occur. They recommend that every county council, in consultation with the county district councils, should frame a scheme of whole-time appointments for the county, statutory provision being made for this purpose. As vacancies occur in part-time posts in county districts, the district council should appoint a medical officer either solely or jointly with the county council or other local authorities on terms which preclude the medical officer from engaging in private practice. The Royal Commission adds that in special circumstances the Minister of Health should be empowered to waive this requirement on a representation from the county council or other local bodies interested. But the report stipulates that such an exception should only be made if the Minister thinks insistence on a whole-time appointment is "for the time being" unreasonable. We are evidently approaching the moment when the requirement will be universal.

Annotations.

"Ne quid nimis."

TUBERCULIN TESTING OF CATTLE.

WITH the assistance of the Medical Research Council as a coördinating centre the tuberculin test is attaining great accuracy and precision in the diagnosis of bovine tuberculosis. Two reports have been issued by the Tuberculin Committee of the Council, which has now been at work for eight years. In the former of these,[1] dated 1925, the Committee found the subcutaneous test to be satisfactory enough under laboratory conditions, but subject on the farm to many fallacies and defects of interpretation. They were concerned therefore to introduce a modification of the intradermal test which would be suitable for ordinary field work. This has now been done and the double intradermal test, as it is called, is the subject of the report [2] before us, the technique being described in detail in an appendix. The report is based upon the experience of 77 veterinary surgeons who replied to a questionaire, drawn up by Prof. Buxton and Dr. MacNalty, which comprised 11 questions designed to elicit not only the surgeon's experience of the test but also his views on the problems and difficulties arising in the conduct of the test. The replies admit of compact summary, for it appears that the new method is being increasingly used and approved by veterinary surgeons throughout the country for the testing of graded herds; its trustworthiness has been amply confirmed by the results of post-mortem examination. Put in a few words, the double intradermal test is simple, clean, and easily performed under farm conditions, its technique is easily acquired, it saves the time of surgeon and stock-owner, it does not disturb farm routine, it has little or no effect upon milk yield, and it may be applied without risk to pregnant cows and to very young animals. One surgeon describes it as a real godsend to the single-handed country practitioner. It is true that a certain percentage of doubtful reactions have occurred, the proportion varying widely in individual practice, but the Committee explain these doubtful reactions as due on the one hand to concentration on local reaction to the exclusion of such clinical factors as pain, heat, and tenderness, and on the other to the well-known insensitiveness to tuberculin of animals with chronic advanced tuberculosis. The former difficulty is to be surmounted by acquiring a sense of proportion, the latter by finding gross signs of tuberculosis on physical examination. In the small percentage of cases which may still appear doubtful, the proposal is to retest by the double intradermal method using sterile broth as a control. It may prove possible to render the test more conclusive by increasing the strength of tuberculin employed, this to be done without increasing the bulk of the present dose (0·1 c.cm.). One great advantage of the experience gained is the elimination of other tuberculin tests; the ophthalmic test is now regarded as untrustworthy, and other subsidiary tests are left to the discretion of the veterinary surgeon. And, finally, the intradermal test is comparatively little influenced by the previous application of other methods of testing, which is as much as to say that the practice of "doping" or "faking" a suspected cow with tuberculin before submission to the veterinary surgeon will now be futile. Apart from its application to veterinary medicine the work of Prof. Buxton and Dr. MacNalty will most certainly react on the use of tuberculin in human practice where a higher standard of scientific precision is equally to be desired.

[1] See THE LANCET, 1925, i., 831.

[2] The Intradermal Tuberculin Test in Cattle. By J. Basil Buxton and A. Salusbury MacNalty. Medical Research Council, Special Report Series No. 122. H.M. Stationery Office. 1928. Pp. 64. 1s. 6d.

THE DEATH CERTIFICATE.

WHEN the law of death certification was altered two years ago, the changes failed to satisfy those reformers who wanted something more than half a loaf. Their criticisms of the present system, with its serious risk of premature burial and the non-detection of crime, did but repeat what had already been said by a Select Committee of the House of Commons in 1893 and by a Departmental Committee in 1910. A vigorous pamphlet by Sir George Greenwood,[1] whose death occurred suddenly last week, now sums up these criticisms afresh. He cites an answer given by the Minister of Health in the House of Commons in 1923 to the effect that in the previous five years 31,332 deaths had been uncertified in England and Wales; he mentions the recent estimate of a London coroner that some 5000 people are buried every week in England and Wales whose death certificates have been given without the body being seen by the certifying doctor; and he recalls the saying of Dr. Richardson some 40 years ago that he did not know one medical man of extensive practice who, in the course of it, had not met with a case of secret murder. What the reformers wanted, of course, in 1926 was not the Government's Births and Deaths Registration Bill (which was passed into law at the end of that year), but the Bill framed by the Special Committee of the Federation of Medical and Allied Services. The latter Bill proposed to enact that a medical certificate of the fact of every death or still-birth must be given by a registered medical practitioner who has viewed and examined the dead body and is satisfied that life is extinct. The most audible objection to this proposal was the difficulty of finding the money for the doctor's fee. The relatives would not object, replied the reformers, if the fee for this post-mortem visit were made recoverable like the fees for visits during the patient's life-time; the cases of poor people could be met by a simple extension of the panel system or the poor-law rules. The reformers, however, were defeated: some of the medical members of the House of Commons transferred their support to the Government's Bill, and Sir Kingsley Wood declared that a complete medical examination in every case, as the reformers desired, "would mean very considerable expense and would set up a universal and compulsory requirement for a very small chance indeed." A much less drastic change was made. The form of medical certificate of the cause of death now shows the date when the certifying doctor last saw the deceased alive, and further shows whether or not he saw the deceased after death. Regulations under the Act of 1926 require that the registrar shall report to the coroner inter alia any case where the deceased was not attended by a registered medical practitioner during his last illness and also any case where it appears that the deceased was seen by the certifying doctor neither after death nor within 14 days before death.

Sir George Greenwood's lively pen attacks the Minister of Health, the Registrar-General, and all bureaucrats in Government offices because the law does not go far enough and because its provisions are to be sought in a multiplicity of statutes and statutory rules and orders. Legislation in advance of public opinion is unlikely, and, unless some sensational case occurs, the education of public opinion is a slow process. The Acts are certainly in a dismal tangle, but the new code of statutory regulations, long as it is, is a vast improvement on its predecessors. As a former member of the House of Commons Sir George Greenwood will know that Parliament no longer seems willing to find time to legislate directly upon such matters as that code contains. To that extent his allegation of bureaucracy comes too late in the day. Indeed, the public may see a less offensive bureaucracy in the present system than in the proposed intrusion into their homes of the doctor

[1] The Law of Death Certification. By Sir George Greenwood. Humphrey Milford, Oxford University Press. 1928. 2s 6d.

who comes to pay his compulsory post-mortem visit. The reformers have to persuade the public of the necessity for the reforms; for this purpose Sir George Greenwood's pamphlet is well conceived and timely, and it is sad that he is no longer here to press the arguments home.

PROPHYLACTIC INOCULATION OF ADULTS WITH B.C.G.

HITHERTO Calmette's living B.C.G. vaccine has been used almost exclusively for the protection of newborn infants in tuberculous surroundings. The vaccine has been given by the mouth to these infants, and Calmette has taught that the permeability of the gastro-intestinal tract to his vaccine is more or less peculiar to the newborn, and that it diminishes greatly, or ceases, soon after birth. In a paper published in *Tidsskrift for den Norske Laegeforening* for Oct. 15th, Dr. J. Heimbeck, of the Ullevaal Communal Hospital in Oslo, to whose work on tuberculosis in nurses we referred not long ago,[1] publishes observations in support of B.C.G. inoculation of young Pirquet-negative adults. Since May, 1926, he has given this vaccine by subcutaneous injection to 726 Pirquet-negative persons under the age of 30. The dose of 0·2 mg. was found to provoke abscesses and sinuses in many cases, and was therefore reduced to 0·05 and, in some cases, to 0·03 or 0·02. He was able to keep under personal observation as many as 322 patients, and in no case did symptoms of general illness, or permanent sequelæ, develop. In 53 cases abscesses formed; they lasted for a week to five months, but cleared up quickly when treated with sunlight or quartz-lamp light. Inoculation of guinea-pigs with the pus in eight of these cases never provoked tuberculosis. In 114 cases an infiltration formed at the site of the infection, persisting for a year or more and attaining a maximum dimension of a pea, but causing no tenderness. In 294 of the 322 controlled cases, the Pirquet reaction changed from negative to positive, and in no case did a repetition of the test show that the reaction had again become negative. Of special value in estimating the importance of this procedure were the observations made on the nursing staff of the hospital. The nurses were classified according to the years in which they joined the hospital, to their reaction to the Pirquet test, and to their treatment, or lack of treatment, with B.C.G. Of the 1924 class, who were Pirquet-negative, eight had developed tuberculosis by August 31st, 1925. Of the 1925 class, who were Pirquet-negative, 18 developed tuberculosis during a similar interval, and this was the fate of 14 of the Pirquet-negative nurses of the 1926 class. In other words, 16 per cent. of these Pirquet-negative nurses developed tuberculosis soon after coming in contact with tuberculous patients. Altogether 89 Pirquet-negative nurses were inoculated, 5 in October, 1926, 44 in 1927, and 40 in 1928. The nurses inoculated in 1926 had already been in contact with tuberculous patients for three or four months when they were inoculated. All the other nurses were inoculated as soon as they were found to be Pirquet-negative, and before they were set to work with tuberculous patients. Two of these 89 subsequently developed signs indicative of tuberculosis—pleurisy in both cases; but one of them belonged to the 1926 class, which had been exposed to infection for some months previous to the inoculation, and the other developed pleurisy only a month after the inoculation—i.e., at a stage when there had not been time to gain immunity. In the 1927 class there were 12 Pirquet-negative nurses who refused to be inoculated, and five of them subsequently developed tuberculosis. In the 1928 class there were 18 Pirquet-negative nurses who were not inoculated, and three of them have since developed tuberculosis, whereas of the 40 Pirquet-negative nurses of the 1928 class who were inoculated, only one fell ill—the case of pleurisy already referred to. Thus, for the 1927 and 1928 classes, the tuberculosis morbidity among the 84 inoculated Pirquet-negative nurses was only 1·2 per cent., whereas it was 27 per cent. among the 30 Pirquet-negative nurses who were not inoculated. It is safe to predict that Dr. Heimbeck's extension of Prof. Calmette's preventive inoculation to include Pirquet-negative persons irrespective of their ages will arouse the greatest interest everywhere, and will lead to a repetition of his experiments on a large scale.

[1] THE LANCET, 1927, ii., 290.

HEALTH OF THE NAVY.

THE arresting feature of the Statistical Report on the Health of the Navy for 1926[1] is the general reduction reported in tuberculosis. Pulmonary tubercle accounted for 187 cases, 174 invalidings and 13 deaths, compared with 221 cases, 197 invalidings and 31 deaths in the previous year, the rates per 1000 being 2·06 cases, 1·91 invalidings, and 0·14 deaths, as against corresponding rates of 2·45, 2·19, and 0·31 in 1925. Of non-pulmonary tubercle there were 24 cases, with 21 invalidings and 1 death, compared with 28 cases, 27 invalidings, and 6 deaths in the previous year, the rates per 1000 being 0·26 cases, 0·23 invalidings, and 0·01 deaths, as against 0·31, 0·30, and 0·06. Every one of these figures is less than the corresponding one for the preceding year, and we hope these may be the first fruits of a harvest that has long been worked for, the chief means employed being early recognition and separation of cases, combined with efficient ventilation of ships—such ventilation as Surgeon-Commander S. F. Dudley described on p. 853 of our last issue in his address to the School Medical Officers' Association. The new report contains several new and interesting tables. The ages of the men in the Navy are stated, their liability to tubercle of the lung at the various ages, and the liability to pulmonary tubercle in various classes of ships; there is also the usual table of men invalided at various ages. From these data we learn that there were in the Navy in 1926 some 40,000 men under 25 years of age, and some 50,000 above that age; of every 1000 under 25, 21 would probably be invalided (1·3 for accidents, 1·7 for pulmonary tuberculosis, and 0·27 for other tuberculosis), whilst the corresponding number for those over 25 would be 17·5 (0·78 for injury, 2·2 for pulmonary tuberculosis, and 0·21 for other tuberculosis). Thus after the age of 25, men in the Navy had a lessened risk of invaliding for accidents and for non-pulmonary tuberculosis, but a greater risk of invaliding from pulmonary tuberculosis. The greatest risk of developing tubercle of the lung falls at the ages between 20 and 25, and next greatest between 25 and 35, the most numerous group of all. It would be useful to have the latter group further subdivided into the ages 25–30 and 30–35, this separation being particularly important as for many men the first period of engagement ends at about 30. Battleships and barracks show the heaviest incidence; it gradually lessens through cruisers, destroyers, and submarines, and is low in training establishments. Perhaps the reason why smaller ships have fewer cases is that there is less chance of an infectious case embarking in them. Telegraphists are no longer the group most affected with tubercle, and there were but two cases in the sick berth staff; ships' cooks are rather prominent, but not outstanding, as they were in 1909, 1911, and 1914. It may be noted that enteric fever diminished in 1926, also dysentery, but there was a slight increase in malaria. A case of cholera in China is stated to have been cured, clinically and bacteriologically, within 12 hours by the mixture of essential oils recommended by Tombs. Vaccination is repeated every five years; but one slight case of small-pox occurred at Shanghai, the patient having been vaccinated four years before. Influenza increased, causing 1769 cases as against 1149 in 1925, but was comparatively mild; various methods of prevention are mentioned, but the results

[1] H.M. Stationery Office. 1928. Pp. 149. 4s. 6d.

of the preventive inoculations given are not stated. Venereal disease was less prevalent, the rate per 1000 being 67·90 (71·70 in 1925); syphilis was six times more frequent in China than at home. Calomel cream and mercuric iodide soap are the favoured preventives. The teeth of recruits and of men in the service are improving. There were 27 deaths from diseases of the digestive system, but no death from duodenal ulcer. Scabies has slightly increased, and on the average treatment lasts nearly six days. Gout has decreased (38 cases instead of 45). One man died of tetanus after an accident in the Atlantic Fleet in spite of anti-tetanus inoculation. There were several cases of encephalitis lethargica, and five deaths from cerebro-spinal meningitis. The account of the training ships is meagre, but *Impregnable* seems to have had more pneumonia and tubercle than *Ganges* (at Harwich). There is no account of the health of the cadets at Dartmouth.

THE ÆTIOLOGY OF DENTAL CARIES.

THE time has come when Mrs. Mellanby's work on the ætiology of dental caries should receive serious attention, expressing itself in a practical manner. Her main thesis is well summed up in the *British Dental Journal*,[1] and though criticism may be launched against several points, yet the general conclusions are so convincing that her recommendations should receive a widespread trial. Mrs. Mellanby's experiments on animals and her examination of human teeth all furnish evidence in support of the dietetic theory of dental caries, that is to say, the dietetic theory as it affects tooth structure; she does not deny that mechanically cleansing foods and general hygiene of the mouth may play a large part in preventing the decay of ill-formed and ill-calcified teeth, but any fundamental attack upon the problem must include an explanation of why the teeth are ill-formed and ill-calcified. She concludes from her work that two factors favour calcification, adequate anti-rachitic vitamin, either supplied in the food or else produced in the body by its direct exposure to sunlight, and an adequate supply of calcium and phosphorus in the food; a factor which hinders calcification is the inclusion in the diet of much cereal food, in which a positive anticalcifying substance has been identified by E. Mellanby.[2] A diet adequate in the two first particulars and not over-weighted with cereals, will, she believes, produce perfect teeth in the child and preserve them in the adult. For it would appear not only that well-calcified teeth may become decalcified later following a period of unsatisfactory diet, but also, and this is a hopeful finding, that badly calcified teeth may be improved by a formation of well-calcified secondary dentine when the diet is improved. As Mrs. Mellanby believes that vitamin D is the chief defaulting factor in our diet, coupled with an excess of cereals, anyone can put her theory to the test by using cod-liver oil or radiostol. In her experience the deciduous teeth of children who have regularly taken cod-liver oil are much superior in structure to those of the average child not so treated. She evidently does not believe that a deficiency of salts, particularly calcium, plays an important part as an ætiological factor in humans. The question, "Are the teeth of peoples whose diet contains abundant fat-soluble vitamins less liable to caries than those whose diets are deficient in these vitamins and excessive in cereals?" she answers, on the whole, in the affirmative, instancing the teeth of the Esquimaux and of the inhabitants of tropical countries. But she does not mention the people of Australia and South Africa, who must receive abundant vitamin D from their wonderful and continuous sunshine and yet have terribly carious teeth. To one Australian worker on vitamins the condition of her compatriot's teeth was almost an obsession; no hypothesis of vitamin deficiency will explain their condition, and one is almost forced to postulate an absolute deficiency of calcium as an explanation. Vitamin D makes available calcium which would otherwise not be available, but it cannot rectify the deficiency beyond a certain point. Recent work directed by Dr. J. B. Orr,[3] of the Rowett Institute, among school-children in Scotland, has shown that an addition of separated milk is as good a supplement for inducing growth as a corresponding addition of whole milk, which can be interpreted as evidence that an addition of salts acts very beneficially. At any rate the possibility should not be overlooked that a deficiency of calcium may exist alongside a deficiency of vitamin D in our own diet, so that an attempt to make a small increase in both these factors might be the most practical means of dealing with the problem.

[1] British Dental Journal, 1928, xlix., 769.
[2] Medical Research Council Special Report Series, No. 93.

A RADIUM-PLATINUM ALLOY.

AT a congress of science and medicine held at Hamburg in September last, Dr. Max Heiner gave an account of the use he had made of so-called radium-points, made from an alloy of radium and platinum which can be worked as easily as the latter alone. Pointed cylinders of this alloy are used just like ordinary radium tubes and needles, but with this difference: that when introduced into the body radon diffuses into the surrounding tissues and disintegrates intracellularly; so that biological effects are to be expected not only from the gamma rays, but also from the much more potent alpha and beta rays. Dr. Heiner stated that he had used points, each containing 0·1–1·0 mg. of radium element, during the past two years in the treatment of a variety of diseases, including malignant tumours, chronic eczema, psoriasis, chronic septic condition of the gums, the jaw, and nose. In chronic septic conditions of the gums the technique adopted was to insert the points into the gum pockets, leaving them in position for one to three hours, the treatment being repeated in three days. Two weeks later striking improvement was to be noted; the redness, swelling, and bleeding had disappeared, and the gums had regained their normal consistency. It appears that some 30 cases of malignant disease have been treated by the same means, the points being inserted about 1 cm. apart for periods up to 24 hours. The results claimed for this method are such as to stimulate a desire for further information.

THE BUNDABERG DISASTER.

THE puzzling feature of the Bundaberg disaster[4] was that staphylococci, according to the hypothesis, produced vomiting, diarrhœa, unconsciousness, cyanosis and pyrexia, causing death within 24 hours, and that at autopsy no scattered septic foci were found. Pathologists will be interested to learn that the investigations reported by the Royal Commission are being continued.[5] The staphylococcus, resembling No. 1393 of the National Collection at the Lister Institute, isolated from the bottle of prophylactic used "was proved by Dr. F. M. Burnet to be identical with that isolated in pure culture from the abscesses in all those children which were examined. The identity of these staphylococci was shown by their agglutination reactions with sera made from cultures of the organism isolated from the Bundaberg bottle, by the exhibition by all the cultures of the Müller phenomenon (the appearance of a zone of punctuate hæmolysis round the colonies on hormone blood agar), and by their specific reactions to a bacteriophage active against the strain from the Bundaberg bottle." Dr. Burnet obtained positive intradermic reactions in about half of a group of people tested with the filtrate of the coccus diluted 500 to 2000 times. The sera of

[3] THE LANCET, 1928, i., 202.
[4] See THE LANCET, 1928, i., 249, 1293.
[5] The Walter and Eliza Hall Institute of Research in Pathology and Medicine, Ninth Annual Report, 1927–28 (Melbourne).

some insensitive persons neutralised the filtrate; it was non-toxic to laboratory animals. But no further light has been shed on the central problem—can staphylococci, non-lethal to almost all laboratory animals, when given in large numbers together with any toxic products of growth for some days, kill human beings within 24 hours? The Commission record two cases from the Brisbane Hospital in which a septic osteomyelitis, apparently due to *Staphylococcus aureus*, caused death within 24 hours (presumably without septic metastases, though this is not stated). Such cases are not common. Neisser[6] states that a number of bacteriologists have injected into themselves thin suspensions of staphylococci without producing any effect save local septic abscesses. It is true that the mortality from staphylococcal septicæmia is high—all of 11 patients quoted by the Commission from Sydney records died—but death in these instances followed illness lasting from 3 to 21 days, and autopsy revealed the usual septic processes throughout the body; this sequence differentiated these cases from those in Bundaberg. Pathologists, while feeling that the conclusion is not in full accord with their previous knowledge and experience, must agree with the Commission that in the absence of further information the deaths must be attributed to the staphylococci.

THE MALARIA PROBLEM IN BOMBAY.

THE history of malaria in Bombay is disheartening. The city is peculiarly adapted, by its warmth and humidity, to the breeding of mosquitoes, and many localities are infested by swarms of several varieties. Modern improvements have complicated an already difficult position, and the more abundant water-supply, with its accompanying drainage system, has enormously increased the facilities for mosquito breeding. In 1911, after a systematic survey which extended over two years, a comprehensive report on malaria in Bombay was submitted by Dr. C. A. Bentley. This report has been deservedly alluded to on several occasions as classical, but in the interval many changes have occurred, and it was felt advisable to have a further survey before the Municipality committed itself to an expensive campaign. Major G. Covell was appointed to carry out observations, and his report [7] now before us sets out the results of a six months' survey, designed to supplement Dr. Bentley's work where conditions had altered in the interval.

Practically speaking, only one species of mosquito is concerned in the conveyance of the disease in Bombay, and this (*Anopheles stephensi*) breeds in fresh clean water, so that Major Covell can go so far as to remark that the problem of its destruction is entirely separate from that of the provision of adequate schemes of drainage. This mosquito breeds in wells, cisterns, garden tanks and tubs, leakages from reservoirs, improperly graded roof gutters, empty tins and other receptacles, hollows in scrap-iron, abandoned buildings, and other similar situations. The larvæ will flourish in any depth of water, and in dark places as well as those exposed to the direct rays of the sun, and one of the most fertile breeding grounds is furnished by the household wells, which are still unfortunately a feature of many of the older residences of the city. The problem of prevention is largely one of domestic economy, and is tenfold more difficult in a cosmopolitan community where people of not only one but many religions are involved. Strangely enough, the Parsees, in many ways the most advanced community in India, are one of the principal obstacles in this case. Their intensely conservative priests, who are not up to the level of their flock in general education, make use of well water for ceremonial purposes, and this is one of the chief reasons why many well-to-do Parsees refuse to fill in their wells. Entry into both Hindu and Mohammedan houses for purposes of inspection is deeply resented, and any thorough system of household visitation must be done partly by women.

The condition of Bombay as regards malaria seems to be getting progressively worse. Areas little affected 40 years ago are now seriously involved, and some of the best business and residential quarters are heavily infected. Apart from the sinister influence, direct and indirect, of malaria on the general mortality of the city, the financial effect of the excessive sick-rate on the cotton industry and other business interests is very severe, and it is easy to show that the heavy expenditure which would be involved by an extensive antimalarial campaign would be more than justified by the savings which could be expected. To make any scheme effective certain legislative action would be needed to bring under one control not only the areas directly under the municipality but also those administered by the railways and port trust, and other more or less independent bodies. It is to be hoped that means may be found to provide the necessary machinery and funds, and that the city of Vandyke Carter, who was the first in India to confirm the epoch-making discovery of Laveran, may before long emulate Ismailia and Havana, and set its house in order. The solution of the malaria problem in rural areas presents difficulties which under certain conditions may well prove insuperable, but a wealthy city like Bombay has only itself to thank if it continues to labour under this scourge.

INSTRUMENTAL AIDS FOR PARALYTICS.

CASES of extensive incurable paralysis, from whatever cause arising, can be benefited in two ways by the use of instruments; first, by the fixation as required of a flail and untrustworthy joint; and, secondly, by devices which utilise in the best possible manner any muscular power that may be still possessed by the patient. It is chiefly for the invention of such devices that the work of Dr. Gabriel Bidou has become famed, not only in France, but throughout the world. His books on mechanotherapy and orthopædic instruments are well known, and of recent years he has become specially interested in the treatment of paralysed patients. Prof. Georges Guillain enlisted his coöperation for patients of this type at the Salpêtrière, and the results obtained were so remarkable that the Director of the Assistance Publique has made arrangements to create in the near future a special service of functional recuperation under Dr. Bidou's direction. The principles which guide his treatment have been set out in a little book,[1] on the title page of which Dr. Bidou's name appears, though it is only in the preface, contributed by Prof. Guillain, that it is made clear that Dr. Bidou is actually the author. The mathematical and mechanical principles on which Dr. Bidou works, as well as certain applications of them, are well set out. His methods involve the use of a measure of the equivalence of the weight of the limb in question, of a special dynamometer, and of a rule and "musculometer" of his own as well as a goniometer. He then describes the application of various special mechanical devices which he has found useful, and also apparatus suitable for various parts of the body, both for support and for the improvement of muscular force. This is thoroughly scientific work and embodies an attempt to treat the problems presented by exact measurement of forces and of the mechanical parts concerned such as joints and limb leverage. Until Dr. Bidou devoted himself to these studies, the design and construction of orthopædic instruments had been too much a matter of rule-of-thumb, and despite the difficulties of treating living parts in the same way as the dead metal of a machine, the only hope of improvement is in the

[6] Handbuch der Pathogenen Mikroorganismen, 1927, iv., 470.

[7] Malaria in Bombay, 1928. By Major G. Covell, M.D. Lond., I.M.S. Price 2s. 6d.

[1] Principes Scientifiques de Récupération Fonctionelle des Paralytiques. By Gabriel Bidou. Preface by Prof. Georges Guillain. Paris: Le Livre pour Tous. Pp. 141, with 45 plates. Fr.20.

pursuit of his ideals. His progress as director of the special hospital of Ste. Isabelle, founded by M. E. U. de Hoz, will be watched with keen interest by all concerned with the rehabilitation of the paralysed cripple.

LIGHT AND HEAT IN MEDICINE.

THE second International Conference on Light and Heat in Medicine, Surgery, and Public Health, organised by the *British Journal of Actinotherapy*, was opened at the Imperial Institute, London, on Oct. 29th by Sir John Snell, chairman of the Electricity Commission, with Dr. F. E. Fremantle, M.P., in the chair. Dr. E. P. Cumberbatch presided at the afternoon session of the first day, and Dr. Justina Wilson in the evening. Speaking on actinotherapy in nervous affections of the skin, Dr. W. J. O'Donovan disclaimed any specific local curative value in eczema, acne rosacea, varicose ulcer, and alopecia areata. He regards these affections as local signs of "constitutional conditions"—preferably termed "nervous affections"—and ascribes the benefit derived in such cases from irradiation to its general stimulating effect, its soothing local influence, and the advantage got by a neurotic patient from treatment of good public repute. Dr. Franz Nagelschmidt, who addressed the first International Conference in London last year, has again come from Berlin to take an active part in the proceedings, and read an important paper on a new method of applying heat by diathermy. As a result of his work in Chicago University, experimenting with various wave-lengths, he has constructed a new type of diathermy machine. His aim is to introduce more energy and to avoid burns, and to this end he uses large metallic electrodes between two rubber layers. The temperature of the body can be raised to any desired degree, producing "aseptic fever," whilst loss of heat is discouraged by covering the patient, and sweating is prevented by injecting hypertonic saline into a vein. Oxygen consumption is lowered during treatment, also the breakdown of albumin, and the patient is said to gain weight. Characteristics of this new apparatus are short wavelength, high number of sparks, and high tension. Dr. Nagelschmidt advises diathermy for pneumonia, especially in unresolving cases, as a fall of temperature by lysis and occasionally by crisis is observed after treatment. A third paper was read by Dr. W. Flaskamp, chief assistant in the Erlangen University Gynæcological Clinic, where he has had ten years' experience in the treatment of gynæcological conditions by heat and light. Local and general light and heat treatment are used extensively at Erlangen in conjunction with other methods of treatment. He considers that acute inflammatory conditions of the uterus and adnexa are contra-indications to the early application of local heat and of light, but subacute and chronic conditions respond well to these methods. In the evening Dr. W. Kerr Russell, of Newcastle, gave a lantern lecture illustrating various types of lamps and therapeutic methods.

MATERNAL WELFARE AND THE GENERAL PRACTITIONER.

THE important meeting held at Westminster on Tuesday last, and briefly reported on another page, shows how the continuance of the high maternal death-rate in childbirth is moving contemporary opinion. At this meeting a resolution was passed regretting the inadequacy of the maternity services in many parts of the country, rural and urban, and pledging itself to arouse public opinion so as to raise the more backward districts to the level of the best. In delivering his presidential address to the Society of Medical Officers of Health on Oct. 19th, Dr. J. Howard-Jones took as his text prevention, and dealt with the means by which the general practitioner could forward it. Inevitably a large portion of his address was devoted to maternal morbidity. The survey of the facts which he gave will be familiar to all who are in touch with this problem, and illustrate how very difficult it is to say anything new about it. Nevertheless, it would be the gravest mistake on that account to accept our 5 per mille maternal mortality-rate as a fact of nature which could not be changed. The records of the first-class hospitals, quoted by Dr. Howard-Jones, show that it is possible to reduce death and disease in child-bearing to a very small figure indeed, provided that labour is conducted properly and, most important of all, that every mother is subjected to competent antenatal care. There is no likelihood that the hospitals and clinics will fill the antenatal needs of more than a small part of the population in the lifetime of the present generation, and it would be rather a pity if they ever did. The general practitioner is indispensable in this field; but the fact remains that, for whatever reason his efforts to reduce maternal mortality have not been very fruitful. There are two main reasons for this. The first is that the average practitioner on qualification has not been taught enough about antenatal work. Dr. Howard-Jones pointed out that most of the older midwifery text-books pass it over with a desultory mention, and only in the most recent ones is it given the thorough and systematic attention it deserves. The science of gynæcology and obstetrics is generally admitted to be the Cinderella of the medical curriculum; its teachers have to struggle hard to complete even the essentials in the time allotted to these subjects, and it is small wonder that a comparative newcomer like antenatal work should be crowded out. So instead of accepting this duty as a matter of course, the student finishes his training with neither definite plan nor definite inclination to break what is still new and stony ground. The difficulty of this task, when he does undertake it, is the second reason why it is so badly neglected. The public are not nearly educated up to requiring antenatal care, still less to paying for it. One of the speakers at the meeting of the obstetrical section of the British Medical Association at Cardiff this year, a practitioner of many years' experience, narrated how he had attended a woman of the labouring class in a very anxious confinement and had warned her solemnly that unless she came to be examined in good time before her next confinement he would have nothing to do with it. His next meeting with her was in the middle of her next labour, to which he had been urgently summoned to deal with a precisely similar complication. This undoubtedly typifies a very general attitude; in plain words, most women of the less educated classes, and probably of the better educated classes as well, will not be bothered. Again, when a conscientious doctor does manage to bully his patients into coming up for examination, he finds them unwilling to pay him anything like adequate remuneration. They do not appreciate the importance of the service, and they grudge the money. On the other hand, a fair number of town practitioners have found that patients will not cavil at an inclusive fee, one not perhaps as large as it ought to be, but at any rate one which marks a distinct recognition of the value of antenatal treatment. Perhaps this is one of the most promising lines of approach. Dr. Howard-Jones recognises that this branch of preventive medicine, like every other, depends entirely on the education of the public, but he does not indicate how this education is to be achieved. In America great efforts are made through the lay and semi-lay press; here most of the burden falls on the devoted head of the individual practitioner, whose efforts are promptly met with the accusation of self-seeking. The practitioners of this country have the pioneering and altruistic spirit very highly developed, but they have every right to expect more support. This can be most effectively given in the form of propaganda, chiefly in the lay press. In Soviet Russia, where most of the amenities of civilisation are at their lowest, the Government handle the problem of antenatal propaganda in an effective way by keeping persuasive reading matter, illustrated by attractive and intelligible pictures, constantly before every worker and peasant in the

country on hoardings and in newspapers. A certain amount is done here by individuals and voluntary bodies, but it is very little. Not until the central authority takes a lead in this matter will the problem be within sight of solution. The investigation of every death in childbirth by the Ministry of Health (see p. 944) is a step in this direction.

A STATE PSYCHOLOGICAL CLINIC.

THE first annual report of the State Psychological Clinic recently established at Perth, Western Australia,[1] is a modest account of work done, with an outline of further needs and proposals for meeting them. The ground covered by what is admittedly little more than a skeleton staff includes school surveys of normal children and the study and treatment of delinquent and retarded children in the care of the State Children's Department, or reported from the schools, referred by the Children's Court, or brought to the clinic privately. Among the last group were 121 cases out of a total of 260, and we learn also that adult patients took advantage of the clinic for advice or treatment, and that, although smallness of staff and limitations of time seriously hindered the work, yet an attempt is made to treat them by suggestion or psychological analysis. The organisation of the clinic arranges for coöperation with Perth Hospital and the Children's Hospital, whilst the Inspector-General of the Insane acts both in an advisory capacity and as clinic psychiatrist, thus providing a link between asylum and out-patient treatment. Miss Stoneman, the psychologist in charge of the clinic, is also lecturer to the University, and the report expresses the hope that the University will provide recruits who will in the future shoulder the work of testing, teaching, and caring for defectives and abnormal individuals. A scheme for a fully developed department is diagrammatically represented, and includes a University training centre in touch with clinics and day or residential schools, with farm colonies, hostels, and small institutions for special defectives. It is probable that a representative of every item in the scheme could be found in this country. We have our institutes for defectives; in one city a psychologist is attached to a children's court; in another city is a school psychologist, whilst somewhere else is a gaol where there is opportunity for skilled investigation of the mental state of a delinquent. We have one or two clinics where a psychoneurotic child or adult can obtain treatment, and a student with a powerful inner urge and a knowledge of the ropes might learn a little here and a little there which he could piece together into a coherent whole, thus making himself fit to undertake the kind of work described in this report. Efforts are being made to remedy our obvious lack of organisation and also to give medical students an insight into those aspects of psychopathology that are necessary for the general practitioner, faced as he is by problems for which his present training leaves him poorly prepared; but the difficulties are great, and we must envy a new country where a coördinated scheme can be planned from the beginning.

HEAT CRAMP ON SHIPBOARD.

NOT so long ago heat cramps were frequently reported from the stokeholds of men-of-war in the tropics, when they were regarded as a form of heat-stroke; 82 cases occurred in a year on an American ship, and 42 at one time on the French *Bugeaud* in the Red Sea in the year 1900. But oil-burning steamers are increasing and such occurrences are diminishing. Their interest lies in the observation that it was not in the hot engine-room that the cramps occurred but in the cooler better-ventilated stokehold, where heavy toil evoked profuse sweating, to which rather than to the high temperature they are now ascribed. The matter is discussed in two recent papers, one by Surgeon-Captain P. Cazamian,[1] and the other by Lieut.-Commander E. E. Smith, Medical Corps, U.S.N.[2] The syndrome is perhaps best described by Pryor in his "Naval Hygiene" (1918, p. 367). During or after exertion, cramps commence generally in the calves, spreading to the other limbs and abdomen, temperature is raised little if at all, albuminuria is always found. The resemblance of these to the cramps of cholera has been noted, and Willcox (quoted by Smith) described a choleraic type of heat-stroke in Mesopotamia. Cazamian ascribes the cramp, which he regards as a tetany, to diminution by sweating of the free Ca-ions in the blood. Guanidine is formed more freely from creatine in the increased metabolism due to the high surrounding temperature, and in Noël Paton's view it was the Ca-ions which protected the nerve-cells against its attack. Cazamian therefore suggests the administration of calcium chloride in a dose of grs. 60 or more. The exposure of firemen is only intermittent; perhaps that is why so many forms of treatment are thought successful. Sudden death may be due to tetany of the heart muscle which is known to occur in dogs exposed to great heat; after death acute interstitial congestion of the lung and cloudy swelling of the renal tubules are found. Smith does not confidently recommend any form of treatment. Pryor advised sugar as a preventive, and in the British Navy stokers get oatmeal water with lime juice and sugar. The subject requires further examination.

A REPRESENTATIVE council has been created under the new Medical and Pharmacy Act of the Union of South Africa, and the following members have been elected by the medical practitioners of the Union:—Transvaal: Sir Spencer Lister, Dr. R. I. Mackenzie, Dr. C. Porter, and Dr. A. W. Sanders. Natal: Dr. W. T. F. Davies and Dr. A. Mackenzie. Cape Province: Dr. W. Darley-Hartley, Prof. M. R. Drennan, and Dr. D. J. Wood. Orange Free State: Dr. S. M. de Kock. The Government nominees on the council are: Dr. J. A. Mitchell, Dr. J. T. Dunston, Dr. A. J. Stals, and Mr. W. Rood; and the first meeting was held on Oct. 22nd.

THE Society of Apothecaries of London held its first examination for the Mastery of Midwifery from Oct. 15th to 18th, and it is announced that the following candidates were approved: G. D. Eccles (M.B.), R. K. Ford (M.B.), J. A. Lee (M.R.C.S.), F. P. N. Parsons (M.B.), and H. J. D. Smythe (M.S.).

WE regret to announce the death at Falmouth, in his sixty-ninth year, of Dr. F. J. Wethered, consulting physician to the Brompton Hospital, sometime physician and lecturer on medical jurisprudence at the Middlesex Hospital, and a valued member of the staff of this journal.

WE have also to record the death of Sir George Stewart Abram, physician to the Royal Berkshire Hospital, and formerly Mayor of Reading, in his sixty-third year.

[1] Fred. Wm. Simpson, Government Printer, Perth, W.A.

[1] Archives de Médecine Navales, 1928, p. 100.
[2] U.S. Naval Medical Bulletin, 1928, p. 479.

Mr. R. J. McNeill Love and Dr. F. C. Martley have been elected directors of the Medical Sickness Annuity and Life Assurance Society, Limited.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—A meeting will be held at the Society's house, 17, Bloomsbury-square, London, W.C., at 8 P.M. on Tuesday, Nov. 13th, when Mr. C. J. S. Thompson, formerly Curator of the Wellcome Historical Medical Museum, will give an address on the Apothecary and Some Curious Materia Medica of the Seventeenth Century, illustrated by new specimens from the Society's museum.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

IX.—THE INTERPRETATION OF THE BLOOD COUNT.

By S. C. Dyke, D.M. Oxf., M.R.C.P. Lond.,
CONSULTING PATHOLOGIST TO THE WOLVERHAMPTON AND STAFFORDSHIRE HOSPITAL.

THE pathologist faced with a demand for a "full blood count" or "examination of the blood picture," gathers that he is being asked to report upon the state of the formed elements of the blood. The principal of these are the red cells or erythrocytes, and the white cells, and unless more is specifically asked for, most pathologists will confine themselves to the description of these. So far as these elements are concerned, the practitioner, in receiving a full blood count, is entitled to expect information as to the following points:—

Red cells—total number per c.mm., the percentage of hæmoglobin in the blood, the percentage of the normal load of hæmoglobin carried by each red cell, otherwise known as the colour-index, and the presence or absence of abnormal forms.

White cells—the total number, the relative percentages of the various types, otherwise known as the differential count, and the presence of abnormal forms.

Certain other particulars as to the formed elements of the blood may be of value in certain types of cases and may be asked for, or information concerning them may be thrown in by an especially zealous pathologist. These will be in a future article, but they do not form a part of the "full blood count," as usually understood.

A report on the blood-picture may, or may not, supply valuable information in the understanding of a case. Whether or not it is to do so depends not only upon the nature of the case but also upon the knowledge of certain general principles on the part of the interpreter. It is to the discussion of these general principles that it is proposed to devote this article.

PART I.*—THE RED CELLS.

The following table of the normal red cell count indicates figures which are approximate only, and may vary beyond the suggested limits:—

Red Cells of a Normal Person.

Total number	.. ..	5,000,000 to	6,000,000
Percentage of hæmoglobin		80 „	105
Colour-index	.. ..	0·75 „	1·0
Abnormal forms	.. ..		Absent.

Hæmoglobin Percentage.

When the question at issue is the presence or otherwise of anæmia, the hæmoglobin percentage is of prime importance. From this standpoint the function of the blood is to carry hæmoglobin; if hæmoglobin is present in reasonable amount anæmia does not exist or is negligible; if the hæmoglobin is diminished the diagnosis, so far as it goes, is established. This point may seem too simple to be worthy of discussion, but the fact that pallor does not necessarily mean anæmia is far from being generally recognised, and everyone concerned with the examination of the blood has many times had to explain to the clinician that, deathly though his patient may appear, the hæmoglobin percentage is normal and there is no anæmia. There are many ways of estimating the hæmoglobin percentage, and it is unfortunate that they do not all work to the same standard. 100 per cent. of hæmoglobin should represent the percentage present in normal persons; in actual practice, no matter what method is used, the percentage in the majority of normal persons is found to fall somewhat below this figure. It may vary during the day, and in women it is a little lower than in men, but no matter when or from whom the specimen may be taken, anything from 80 to 105 per cent. may be regarded as perfectly "normal." Some degree of anæmia demanding treatment may be regarded as being present when the hæmoglobin percentage is found to be 60 per cent. or below; when 35 per cent. is reached the anæmia may be regarded as severe, and when it falls to 20 per cent. or below, the infusion of blood is strongly indicated.

The Cell Count.

Five million red cells per c.mm. of blood is usually regarded as constituting a normal count. This figure is purely arbitrary: in young healthy males a count of 6,000,000 per c.mm. may be met with and counts of 5,500,000 are frequent. In females the count is usually lower than in males. Congestion, either local or general, tends to send up the red count; on this account blood withdrawn by venipuncture in the usual way after the application of a tourniquet shows a higher red cell count than blood taken by skin puncture without engorgement; for the same reason cases of right heart failure with much congestion usually give a high red count; the great increase in the number of red cells resulting from sclerosis or partial occlusion of the pulmonary arteries is well recognised.

Polycythæmia Vera.—Increase of the red cells from these causes is to be distinguished from those "idiopathic" cases in which no such causes are to be found. These fall under the head of *Polycythæmia Vera*, Vaquez' or Osler's disease. Such cases are rare and the diagnosis should be made with caution. It should not be thought about until the red cell count has passed 8,000,000 per c.cm.

Colour-index.

In the simple diagnosis of anæmia the red cell count is of less importance than the hæmoglobin percentage. It is no unusual occurrence to find patients with their full complement of red cells, but with the hæmoglobin reduced to 50 per cent. or less of normal. Such patients are anæmic and require treatment in spite of the normal red cell count. More important than the simple number of red cells present per c.cm. is the load of hæmoglobin carried by each. This is expressed as a percentage of the entirely arbitrary "normal" of 5,000,000 per c.mm. Although arbitrary, the convention is of the greatest use. The figure is known as the colour-index.

The colour-index is obtained by dividing the hæmoglobin percentage by the percentage of normal of red cells per c.mm. It is intended to express the percentage of the normal load of hæmoglobin carried by each red cell. For purposes of the computation of the colour-index the normal of the red cell count is taken as 5,000,000. As most normal individuals have under the arbitrary 100 per cent. of hæmoglobin and over the arbitrary 5,000,000 red cells per c.mm., it follows that the normal colour-index is always under unity. A colour-index of 1·0 is unusual in healthy persons.

In all cases where each red cell carries below its normal load of hæmoglobin the colour-index will be low. The best example of anæmia of this type is afforded by *chlorosis*, in which the red cells may be only slightly or not at all diminished, but in which each cell carries too small a load of hæmoglobin. One of the diagnostic points of this condition is the presence of a low colour-index. Most forms of secondary anæmia, whether due to disease or to hæmorrhage, are also associated with a low colour-index. In fact, the only condition characteristically associated with a high colour-index is *primary, Addisonian, regeneratory, or pernicious anæmia.* It

* Part II.—The White Cells—will appear next week.

is now usually supposed that the high colour-index in this condition is due to the unusually large size of the majority of the cells, the cells in bulk thus carrying an abnormally large load of hæmoglobin for their number. In this respect it is important to remember that a normal colour-index is not unity. A colour-index of 1·0 is definitely high and by no means incompatible with a diagnosis of pernicious anæmia.

Morphological Abnormalities.

If, in the stained film, the red cells appear normal, the pathologist may not consider it necessary to mention the matter. Abnormalities, however, are of importance and will always be recorded. The morphological abnormalities of the red cells fall under three heads: the presence of embryonic or young forms, the occurrence of abnormalities of shape and size, and unusual staining reactions.

Embryonic Forms of Red Cells.—The presence of such forms is an indication of unusual activity on the part of the hæmatopoietic system. Their occurrence or otherwise is thus of importance in determining whether or not a satisfactory response is occurring after hæmorrhage, and it may be of the last importance in distinguishing pernicious or regeneratory from aplastic or a regeneratory anæmia. The detection of a single embryonic red cell in a film is sufficient to negative a diagnosis of aplastic anæmia. Red cells are usually regarded as "embryonic" so long as they still bear the nucleus which is normally extruded before they leave their birthplace If of normal size, these nucleated cells are known as *normoblasts*, and their presence in the films of blood from any case of anæmia is merely an indication of a healthy state of activity on the part of the red bone-marrow. If of more than normal size, such nucleated cells are described as *megaloblasts*. The detection of megaloblasts in a blood film is practically sufficient to establish a diagnosis of primary anæmia, though the reverse is far from being the case. In addition to the embryonic nucleated forms certain young though hardly embryonic cells are always present in the blood and occur in large numbers under special circumstances. These are the reticulated red cells or *reticulocytes*. The examination for these must be conducted on fresh blood, and if such is required special arrangements must be made with the pathologist. Examination for them forms no part of the blood picture, as the term is usually understood. Reticulocytes are present in the blood of normal persons in a proportion of from 0·1 to 1·0 per cent. of the red cells. In conditions of active blood regeneration their percentage may be greatly increased. They have acquired a certain prominence lately owing to the fact that one of the first detectable results of a satisfactory response on the part of a case of pernicious anæmia to treatment by liver is a great increase of the reticulocyte percentage.

Abnormalities of size and shape of the red cells are of importance.

Irregularity of size of the cells, some being greater and some smaller than normal, is known as *anisocytosis*. It is usually a feature of the films from cases of pernicious anæmia, but it is quite justifiable to make the diagnosis in the absence of this phenomenon, and its presence does not necessarily imply the existence of that condition. *Microcytosis* or the preponderance of red cells of unusually small size is a feature of many cases of familial hæmolytic anæmia; it is not, however, of great diagnostic importance.

Irregularities of shape are grouped under the heading of *poikilocytosis*. Both anisocytosis and poikilocytosis are usually marked in pernicious anæmia, but they may be absent in this condition and present in other types of anæmia. They have diagnostic value, but there is a tendency to attach too much importance to them.

Unusual Staining Reactions.—In examining blood films it is customary to stain them with one of the dyes of the Romanowsky series usually Leishman or one of its modifications, Jenner, or Giemsa. All these dyes stain the cytoplasm of hæmoglobin-bearing red cells some shade of red, while nuclear material and certain cytoplasmic inclusions occurring abnormally are all stained blue. When the blue dye takes to some extent in the cytoplasmic material of the red cells the condition is known as *polychromatophilia* or *polychromasia*. The staining may be diffuse, in which case it merely indicates a deficiency of hæmoglobin in the cytoplasm or certain definite inclusions may take the blue or basic dye. These inclusions may appear as blue dots in the pink cytoplasm, in which case the condition is described as *punctate basophilia* or *basophile stippling*; in other cases circular or irregularly shaped blue markings may appear in the cytoplasm. These are the "Howell-Jolly bodies" and are usually regarded as being portions of unextruded nuclear material. All the phenomena of polychromatophilia are indications of an unfinished state on the part of the red cells and, as such, point to unusually rapid blood formation. They may all occur in any form of profound anæmia with the exception of the aplastic type, in which blood formation is lacking. They are frequently regarded as characteristic of pernicious anæmia, but this is far from being the case. Basophile stippling or punctate basophilia is of constant occurrence in established plumbism, and no diagnosis of lead-poisoning should be made without search for this feature.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Comdr. F. E. Bolton is placed on Retd. List with the rank of Surg.-Capt.

Surg. Lt.-Comdrs. S. R. Johnston and C. N. Ratcliffe to be Surg.-Comdrs.

Surg. Lts. A. G. L. Brown and P. J. Maguire to be Surg. Lt.-Comdrs.

The following appointments are notified:—Surg.-Comdrs.: J. L. Priston to *President*, for Medical Dept.; E. Heffernan to *Excellent*, and as Ophthalmic Specialist; and T. C. Patterson to *President*, for Naval Medical School, Greenwich. Surg. Lt. L. J. Corbett to *Vulcan*, temp.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lt.-Comdr. R. Hall to *Victory*, for R.N. Hospl., Haslar, for training.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. B. F. Wingate retires on retd. pay and is granted the rank of Col.

The resignation of Lt. (on prob.) J. C. Gilroy is cancelled.

General List.—Temp. Lt. H. I. Clapperton, Dental Surg. (Temp. Flying Offr., R.A.F.), to be Temp. Capt.

TERRITORIAL ARMY.

Capt. A. Bremner (late R.A.M.C.) to be Capt.

Lt. D. R. McGregor is restd. to the estabt.

The King has conferred the Territorial Decoration upon Majs. A. J. Gibson and H. Forrest.

ARMY DENTAL CORPS.

G. E. Nettleship to be Lt. (on prob.).

ARMY RESERVE OF OFFICERS.

The undermentioned Lt.-Cols., having attained the age-limit of liability to recall, cease to belong to the Res. of Off.: R. F. M. Fawcett, J. Dorgan, and H. W. Long.

INDIAN MEDICAL SERVICE.

Lt. J. Quigley to be Capt (prov.).

PATHOLOGICAL LABORATORY AT HALIFAX.—A pathological laboratory and two open-air wards have been added to the Royal Halifax Infirmary, and Dr. H. V. Phelon has been appointed pathologist.

MANCHESTER MEDICAL CHARITIES FUND.—The Manchester and Salford Medical Charities Fund (the Hospital Sunday Fund and Allied Societies) in the year ending June 30th distributed £40,147 to various medical charities. In 1916 £3100 was distributed, in 1919 £5715, and in 1926 £39,703.

Special Articles.

INFANT MORTALITY* AND ECONOMIC STATUS.*

BY PETER L. MCKINLAY, M.D., D.P.H. GLASG.

(From the National Institute for Medical Research, Hampstead.)

WHEN we desire to measure the effect of some possible or probable factor upon the death-rate we always seek to neutralise any other variable factor the influence of which, however intrinsically important, is not relevant to the object of the immediate inquiry. Thus, if we are for the moment interested in the influence of occupation upon mortality, we should seek to allow for the variation in the age distributions of workers in different occupations, because age is a predominant factor of mortality and variations of age might mask any other difference. Many expedients have been devised to this end, and each has its advantages and disadvantages. A much-used method, rejoicing in the formidable title of indirect standardisation, may be simply illustrated. Let us suppose a simple dichotomy of the population into A's and B's, and that the average death-rate of the A's is twice that of the B's, say 20 per 1000 and 10 per 1000 respectively for *all* the A's and B's of the population, without regard to their occupations, place of residence, or any other matters. We now wish to study the effect of, say, occupation upon mortality, and we find that the proportions of A's to B's vary from occupation to occupation, and that in each occupation we can measure the ratio of all deaths to population but cannot distinguish between the *deaths* of A's and deaths of B's, although we can distinguish between the *enumerated* A's and B's at a recent census. Then we might proceed in this way. We might take as a "standard" a population with 50 per cent. each of A's and B's which, by hypothesis, would have a death-rate of 15 per 1000. Now suppose we have two occupations in one of which the proportion of A's is 25 per cent., and in the other it is 75 per cent., and that in one the death-rate is 12 per 1000, and in the other 18 per 1000. We should expect the former group to have a lower death-rate, whatever the effect of occupation on mortality, because it contains a much smaller proportion of A's who, under average conditions, have a higher rate of mortality than B's. Is it reasonable to attribute all the difference to this circumstance?

Let us suppose that in each district the rates of mortality were exactly average, and the gross difference wholly due to a change in the proportions of A's. In the first group we should expect a death-rate of $0{\cdot}25\times20+0{\cdot}75\times10=12{\cdot}5$ per 1000, instead of 15 per 1000, and in the second group we should expect a death-rate of $0{\cdot}75\times20+0{\cdot}25\times10=17{\cdot}5$ per 1000, instead of 15 per 1000, the gross rate when A's and B's are equal in number. We thus see that the group rates actually found, 12 and 18, are not exactly what they would have been had the assumption been correct, but we also see that this factor *might* so nearly account for the observed difference that it could not be sensible to compare 12 and 18 as if the varying proportions of A's could be neglected. What shall we do? An obvious suggestion is to multiply the observed rates by factors which would make the resultants exactly the same *if* the differences were entirely due to varying proportions of A's. The required factors are 15/12·5 and 15/17·5 respectively—i.e., 1·2 and 0·8571. Multiplying the observed rates 12 and 18 by these factors we reach 14·4 and 15·4 as values which, on our hypothesis, are reasonably comparable as measures of contrasting factors other than the varying proportions of A's.

The most serious assumption involved in this process—from the point of view of medico-statistical interpretation—is that in different groups the relative mortalities of A's and B's should be the same. It is easy to imagine cases where the assumption is absurd. Thus, suppose our A's were soldiers and our B's civilians and that a "little war" was on, and one of our groups was in the fighting zone. The method of correction would go a very little way towards freeing the geographical comparison from the effects of varying proportions of A's and B's, because if it was really a very little war its effect upon the standard rates of mortality for all soldiers and civilians would be very small. Nevertheless, the method is a valuable one, and has been widely used to eliminate variations of age constitution in population groups it is desired to compare. The object of this paper is to illustrate its use in another demographic field.

We know that economic status is a factor of mortality—whether directly or indirectly is a question which does not now arise—and we know that the rate of infant mortality seems to be particularly sensitive to variations of economic well-being. We know also that the proportions of "rich" and "poor" vary greatly in different administrative areas. If we adjust the local rates of infant mortality by the method described above, do we appreciably reduce the inter-local variation? The recent publication of the Registrar-General's Decennial Supplement (Part II.) relating to occupational mortality, fertility, and infant mortality has made it possible to answer that question. The object of the present note is (1) to describe a simple method by which such a correcting factor for differences in social position may be obtained, and (2) to ascertain (*a*) how far, when such correction is made, the variation observed in the rates of infant mortality in a sample of districts will be reduced, and (*b*) whether the position of the several districts in respect of mortality is altered by such a correction.

Correction for Variations in Social Status.

From Table H of the report referred to previously the number of births and the number of deaths of infants under one year of age from various causes or cause-groups can be obtained for each of the five social classes recognised in these official reports. (These are Classes I., III., and V., consisting of the upper and middle classes, skilled workers and unskilled workers respectively, and Groups II. and IV. intermediate between I. and III. and III. and V. respectively.) From these data the rates of mortality per 1,000,000 births are calculated, and comparative

TABLE I.—*Relative Mortalities in Different Social Classes.*

—	(1)	(2)	(3)	(4)	(5)
Infectious diseases	0·22	0·57	0·96	1·19	1·34
Tuberculosis (all forms)	0·38	0·68	0·93	1·26	1·11
Diarrhœa and enteritis	0·32	0·59	0·94	1·13	1·42
Developmental and wasting diseases	0·64	0·81	0·98	1·09	1·14
Bronchitis	0·14	0·53	0·98	1·24	1·24
Pneumonia	0·28	0·53	0·97	1·16	1·36
Bronchitis and pneumonia	0·23	0·53	0·98	1·19	1·32
Syphilis	0·22	0·47	0·93	1·21	1·44
Rickets	0·36	0·59	0·86	1·14	1·50
Convulsions	0·54	0·63	1·01	1·16	1·13
Congenital malformations	0·98	0·96	1·00	1·02	1·01
Congenital debility and sclerema	0·34	0·67	0·96	1·15	1·25
Premature birth	0·63	0·81	0·99	1·09	1·12
Injury at birth	1·32	1·16	0·97	1·04	0·86
Suffocation in bed	0·45	0·60	0·91	1·08	1·60
Infant mortality	0·48	0·70	0·97	1·13	1·23

mortality figures for each disease group then obtained by expressing the death-rates pertaining to the legitimate births of each of the classes as a fraction of that of all legitimate births in England and Wales (the data refer to the single year 1921). In Table I. these are presented for all the causes of infant death supplied by the report. The varying degrees to which economic conditions affect the several causes of death

* Since the completion of this paper in June, a paper by Dr. Percy Stocks has appeared in the Annals of Eugenics, vol. iii., Parts 1 and 2, in which similar ideas are involved.

in infancy are thus clearly demonstrated. They range from cases where the higher the social class the higher the rate of mortality—e.g., injury at birth—through a point of indifference in the group of congenital malformations, to an immense advantage for the more prosperous classes in such groups as the common infectious diseases, bronchitis and pneumonia, syphilis and infantile diarrhœa. Discussion of the reasons for these differences will not be attempted here.

The male inhabitants of the districts to be considered must now be distributed into the five social groups of occupation. Information on the occupations of the male population is obtained from the census reports, in which the occupations of males aged 12 years and over are given for individual districts; from this combined with Table A, col. 7, of the Occupational Mortality Report, which gives the recognised social rank of each occupation, we are enabled to obtain the social distribution of each district. The further procedure, which is only an elaboration of my hypothetical example of A's and B's, is made more intelligible by reference to the example given on Table II., where the case of the

TABLE II.—*Example of Method of Correction for Social Status.* (*Metropolitan Borough of Hampstead.*)

Social class.	Population.	Weights.	Weighted population.
(1)	2,686	0·4847	1,301·9042
(2)	8,523	0·6998	5,964·3954
(3)	8,433	0·9708	8,186·7564
(4)	1,789	1·1295	2,020·6755
(5)	1,603	1·2264	1,965·9192
—	23,034	—	19,439·6507

$$\text{Correcting factor} = \frac{23{,}034{\cdot}0000}{19{,}439{\cdot}6507} = 1{\cdot}1849.$$

Crude infant mortality-rate (1921–3) = 55·3 per 1000 births.
Corrected infant mortality-rate (1921–3) = 55·3 × 1·1849 = 65·5 per 1000 births.

metropolitan borough of Hampstead is considered. The comparative mortality figures for total infant mortality are shown in the third column of this table. The adult male population of the borough, enumerated at the census of 1921 in each of the five social classes (col. 2), must now be multiplied by their appropriate C.M.F., and these weighted populations (col. 4) summed. It will be apparent, a priori, that in any district having a social distribution exactly similar to that of the country as a whole, the sum of the weighted populations must be equal to the actual numbers enumerated at the census. If, however, the proportion of males classified to Groups I. and II. be in excess of that pertaining to England and Wales (and the remaining social groups correspondingly in defect) the sum of the weighted population will be smaller than that actually enumerated. Conversely, a population relatively deficient in males of the upper classes will have a weighted population in excess of that enumerated. To obtain the correcting factor for any disease group, then, the actually enumerated population must be divided by the sum of the socially weighted population. The factor thus obtained, when in excess or defect of unity, denotes the existence in the district under consideration of a population constituted with respect to infant mortality (or any of its components) favourably or adversely respectively compared with the country as a whole (the "standard" population). The crude rate of mortality in each district, stated per 1000 births, is now multiplied by its correcting factor for social status, and we thus obtain a distribution of mortality-rates for a series of districts for which variations of economic distribution have been stabilised, so far as the method permits. From the example furnished by Hampstead (Table II.) we see, as is well known from other considerations, that this borough is well above the average social level, and that, reduced to the status of the standard population, the rate of infant mortality would be 18·5 per cent. above that actually recorded—i.e., a rate of 65·5, compared with the crude rate of 55·3 per 1000 births.

Reduction in Variability of the Rates of Infant Mortality.

For the purpose of testing how much closer to one another the rates of mortality would be in a given set of districts if the effect of varying economic status among them were eliminated, the ideal district would be one in which as many as possible of the other factors influencing the rates of mortality in infancy could be deemed sensibly constant. From this point of view, the metropolitan boroughs of London form as near an approach to the desired sample as it is possible to obtain in this country. They are all essentially urban in character, the type of housing (as opposed to the amount of accommodation available) varies little, and geographical and climatic influences may be presumed constant for all. These, therefore, have been chosen for this investigation. Correcting factors have been calculated, as described above, for each borough for total infant mortality and several groups of diseases; and comparison has been made between the conventional mortality-rates and those found after correction for social status. Table III. presents a contrast between

TABLE III.—*Example of the Effect of Eliminating Social Differences.*

—	Crude rates.			Corrected rates.		
	Hampstead	Poplar	Ratio pH.	Hampstead	Poplar	Ratio pH.
Infant mortality ..	55·3	74·4	1·35	65·5	70·7	1·08
Infectious diseases	2·8	5·2	1·86	3·6	4·8	1·33
Tuberculosis ..	0·8	1·4	1·75	1·0	1·4	1·40
Diarrhœa	7·5	9·9	1·32	9·5	9·1	0·96
Congenital debility	23·3	29·3	1·26	26·0	28·4	1·09
Bronchitis and pneumonia	8·0	16·9	2·13	10·5	15·7	1·50

the mortality experienced by the socially best and worst boroughs in the group—namely, Hampstead and Poplar. In the triennium 1921–3, Poplar showed a rate from all causes under one year 35 per cent. in excess of that in Hampstead, but when allowance is made for the wide divergence in the social level of these two districts, this excess is reduced to 8 per cent. Similarly, in the chief cause-groups of death considered, much of the original difference between the two is effectively or, in the case of diarrhœa and enteritis, completely eliminated. These figures suffice to show that in isolated instances we are able to effect a great reduction in the range of the mortality-rates when suitable correction is applied for economic divergences.

But the real problem is a more generalised one. What in bulk is the difference in the amount of dispersion in the rates of mortality when correction is or is not made for social differences? Do we, in fact, after such correction tend to reduce all districts to a mortality experience sensibly equal? The only suitable statistical measure for furnishing an answer to such questions is the coefficient of variation, a constant which expresses the absolute variation in terms of the mean value of the rates of mortality. These, with their probable errors, are given in Table IV. From these results it is clear that although in every group the variability is slightly reduced, in not one instance is it possible to attach statistical significance to the difference found. Thus in this sampled population the tendency towards a levelling of the rates of mortality is a very slight one. Moreover, when we recollect that the various disease-groups considered here are affected in different degrees by the conditions pertaining to differences in social status, no evidence is contained in these figures that the differences in the dispersion of each of these rates would be eliminated if we considered only districts of the same level socially. Stated

otherwise, the death-rate from all forms of tuberculosis varies much more from place to place than, for example, that from congenital debility, and this greater variation is not at all because tuberculosis

TABLE IV.—*Coefficients of Variation (Metropolitan Boroughs).*

—	Crude rates.	Corrected rates.
Congenital debility	11·09 ±1·01	9·32 ±0·84
Diarrhœa and enteritis ..	27·05 ±2·61	24·63 ±2·34
Bronchitis and pneumonia ..	29·06 ±2·83	25·55 ±2·44
Infectious diseases	31·79 ±3·14	28·93 ±2·82
Tuberculosis (all forms) ..	39·62 ±4·09	38·11 ±3·90
Infant mortality	14·99 ±1·38	12·58 ±1·15

is more closely related than is congenital debility to social and economic factors.

Alteration in the Relative Position of the Districts.

The 28 boroughs have been ranged in order from the lowest to the highest with regard to both the crude and corrected rates of infant mortality from all causes and from separate cause-groups. Correlations have then been deduced between the rank which each borough occupies in the distribution of crude and corrected rates. These are collected in Table V. It

TABLE V.—*Coefficients of Correlation (Metropolitan Boroughs).*

Infant mortality	0·951
Infectious diseases	0·970
Tuberculosis	0·992
Diarrhœa..	0·945
Congenital debility	0·953
Bronchitis and pneumonia	0·978

is at once clear from the magnitude of these coefficients that no great change has been effected in the position of the boroughs generally. Those which originally occupied favourable positions have still, after eliminating economic variations, the more desirable rank. The most noteworthy differences, which, it will be seen, are by no means very great, need only be summarised. The two figures after each borough mentioned relate to the position occupied when crude and corrected rates respectively are considered.

All Causes.—Finsbury (23, 18); Poplar (17, 10); Hampstead (2, 6); Holborn (20, 24); Greenwich (8, 4); St. Marylebone (12, 16).

Common Infectious Diseases.—Finsbury (13, 9); Poplar (16, 11); Wandsworth (9, 13).

Tuberculosis.—Hampstead (5, 8).

Diarrhœa and Enteritis.—Bermondsey (21, 15); Finsbury (18, 13); Poplar (11, 5); Hampstead (2, 9); Holborn (15, 21).

Congenital Debility.—Hampstead (2, 8); Poplar (23, 17).

Bronchitis and Pneumonia.—Poplar (21, 15).

Are we entitled to infer from these results that economic status has no intrinsic influence upon rate of mortality or—to put it more bluntly—that if Mr. Bernard Shaw's ideal were realised and all family units enjoyed the same incomes, the variability of the rates of infant mortality of the London boroughs would be much what they are now? I pointed out at the beginning that this method of standardisation rests upon an assumption which may lead us into error. Until I have had an opportunity of applying it more widely—it can obviously, now that we have the rich harvest of results contained in the new Decennial Supplement, be used to standardise mortality in all or any age-group—I prefer to draw no more definite conclusion than that, in spite of the great contrasts between the rates of mortality of different economic groups, standardisation for economic status does not reduce variability so much as seemed a priori probable. I have published these preliminary results in the hope that other medical men may be tempted to use, and criticise, the method.

MINISTRY OF HEALTH.

ANNUAL REPORT OF THE CHIEF MEDICAL OFFICER, 1927.

(Continued from p. 888.)

RESPIRATORY DISEASES.

THE second group of the five conditions responsible for 64 per cent. of the death-rate consists of bronchitis, pneumonia, and other respiratory diseases. Most of these diseases are only preventable by general hygienic measures, especially ventilation and proper clothing, and that section of the male adult population which is exposed in late middle life to changeable and harsh climatic conditions cannot hope to escape some bronchial trouble. But such an acute disease as lobar pneumonia ought to be more amenable to preventive measures than it has hitherto proved. In the pathological laboratory of the Ministry Dr. F. Griffith has been concerned since 1920 in an attempt to throw light on the incidence and pathology of lobar pneumonia by investigating the serological types of the causative organism.

The Ætiological Significance of Pneumococcal Types.

In studying pneumococcal types he has followed the American classification, which divides pneumococci, by serological tests, into Types I., II., III., and IV., and has employed as his standards cultures obtained direct from the Rockefeller Institute. Type IV. is not really a "type," but the residual collection of strains which do not conform to any of the preceding types and present great serological diversity amongst themselves. It is better, therefore, to call it "Group" IV. Examination by Dr. Griffith of sputum from cases of lobar pneumonia has yielded the following results:—

Period of inquiry.	Total cases examined.	Percentage incidence of types.			
		Type I.	Type II.	Type III.	Group IV.
Apr., 1920–Jan., 1922.	150	30·6	32·6	6·6	30·0
Feb., 1922–Oct., 1924.	61	42·6	21·3	3·2	32·7
Nov. 1924–Mar., 1927.	67	34·3	7·4	4·4	53·7

In the third series the incidence of Type II. is unusually low and that of Group IV. is remarkably high. Apart from these two details the table illustrates the following important points, which are in agreement with the observations of other investigators: Types I. and II. are responsible for the majority of cases; Group IV. is the cause of a considerable number; Type III. is relatively infrequent in this disease.

Carriers.—A marked contrast is found when one comes to the types of pneumococci found in normal carriers. It is extremely rare to find Types I. or II., except in contacts with disease due to these types; Type III. is found with variable frequency; in the very large majority of cases the cocci belong to the heterogeneous Group IV.

With reference to the *relation of type to morbidity*, the Rockefeller report for 1917 gave the following figures, which refer to 100 cases of lobar pneumonia not treated with antiserum:—

		Incidence per cent.	Mortality per cent.
Type of Pneumococcus.	I.	33	25
	II.	31	32
	III.	12	45
	IV.	24	16

These figures are fairly representative, though the percentages, as regards both incidence and mortality, are liable to fluctuation from year to year.

Ætiological Significance of Type Characters.

The preceding data raise important questions with reference to the ætiological significance of type characters. Why are Types I. and II. responsible for

more than half the cases? It is obviously not owing to numerical preponderance, because they are the types which occur very rarely under normal conditions. Is it due to greater virulence? It must, in some way, be due to greater capacity for infection; but, when once the infection has set in, the mortality percentage is not markedly higher than that for which Type III. and Group IV., taken in conjunction, are responsible. Why is the incidence of Type III. so low, although it is not infrequent in the normal mouth, and why is its mortality-rate so high? Why is the incidence of Group IV. conspicuously low in relation to the frequency with which it is "carried," though its pathogenicity, as indicated by the mortality-rate, is fairly high? Dr. Griffith has made observations which are of assistance in dealing with these problems.

In the first place, he distinguishes between (1) capacities of the pneumococcus to survive in the air passages, (2) their invasive properties, and (3) their virulence as shown by the mortality-rate. With Types I. and II. (1) is low—i.e., they usually fail to grow in such situations as the mouth and nasopharynx; (2) is high—i.e., they tend to grow readily when they have gained entrance into the tissues; (3) is also fairly high. With Type III. (1) is high, (2) is low, and (3) is particularly high. With Group IV. (1) is high, (2) is low, and (3) is rather low. To this extent, then, serological differentiation of pneumococci may be correlated with differences in their behaviour as infective agents.

The Possibility of Changes in Type.

Do these distinctions imply that the pneumococcal types are fixed and unchangeable? If, as was the more customary belief until recently, types never change from one to another, it is not altogether easy to understand how the types perpetuate themselves.

On making numerous successive examinations of sputum from patients recovering from Type I. infection, Dr. Griffith finds that Type I. disappears and is replaced by Group IV. strains. There is the possibility that the patients were ordinarily carriers of Group IV. and became infected with Type I., which caused pneumonia; Group IV. was in abeyance during the disease, but reappeared on recovery. But there is also the possibility that Type I. did not die out, but became modified into Group IV. Further, if this change could occur, why not its counterpart? Might not Type I. have been derived from a Group IV. strain present before the onset of pneumonia?

The general question as to the possibility of change in type is thus of considerable interest to epidemiologists. On it depends the explanation of two features associated with lobar pneumonia; the disease is generally not epidemic but sporadic, and the individual patient appears frequently to have been infected autogenously and not from his surroundings.

Dr. Griffith has dealt with the problem by the experimental method. For the technical details, his article in the *Journal of Hygiene* (1928, xxvii., 113) must be consulted. In the report only a brief outline is given of the salient features of his work.

He has effected the following conversions: Type II. into Type I., Type I. into Type II., Type I. into Type III., Type II. into Type III., Group IV. into Type I., and Group. IV. into Type II.

The steps which led to these important results are a good example of patient research. Dr. Griffith, whilst investigating the distinctions between "smooth" (S) and "rough" (R) forms of pneumococcal colonies, showed that the change into the R form was associated with loss of virulence; and he found that this change could readily be produced in any pneumococcal type by growing the S strain in its specific antiserum.*

The next step was to show that such R strains could have their virulence restored by inoculation of very large amounts into susceptible animals, and that this change was accompanied by reversion to the S form. It then occurred to him, as a possible explanation of the change, that the R culture contained traces of the S material which was associated with virulence, and that the R survivors picked this out from the mass of their dead companions, utilised it as food, and thereby reconstructed themselves into the S form. To test his hypothesis, he provided an abundant supply of this pabulum, in the form of S culture killed by heat, and injected this together with a small dose of living R strain. In this way he produced a condition of septicæmia from which the S form of pneumococcus was cultivated. Finally he found that the type of the virulent strain so produced was not necessarily the same as that from which the R strain had descended, but often had changed to the type of the killed S culture used as pabulum.

To sum up, the three conditions found requisite for conversion were: (1) The change could only be brought about in the animal body, not in vitro; his experiments were performed on mice. (2) The culture to be converted had first to be reduced to an intermediate phase of partial degradation—i.e., from S to R; this produced a certain loss of specific characters which was necessary before new specific characters could be acquired. (3) Along with the degraded culture, it was necessary to inoculate in the same site (the subcutaneous tissue of a mouse) some killed virulent, or S pneumococci. This dead material acted as a food-supply out of which the R strain could build up its new S organisation; or, perhaps, Dr. Griffith suggests, it also served to enhance virulence in the same way as an "aggressin." Can these three conditions, which were requisite for the experimental change, be regarded as representing conditions likely to produce a change of type in human infections? (1) The mouse is represented by the patient. (2) During convalescence, specific antibodies are present which may degrade an S into an R form, just in the same way as this process takes place by growth in immune serum. (3) In convalescence, also, there is a destruction of virulent pneumococci and some of this dead material may provide the pabulum out of which the R form builds up its new organisation. Modification of bacteria in the animal body always involves the interplay of two factors, the properties of the bacteria and the influence of the host. As regards the latter element, Dr. Griffith calls attention to the remarkable fact that the incidence of the chief types of pneumococci in lobar pneumonia is almost identical in countries where the climatic and social conditions are similar. There is evolution in the individual subject of special types most suited to set up pneumonia; and the similar distribution he explains as due "to similar composition of the population as regards susceptibility to the pneumococcus and not to similarity in the diffusion of pneumococcal types."

Adaptation of Bacteria to Environment.

On the part of the bacteria, he regards their various forms and types as expressions of vital adaptation to meet alterations in their environment. For example, in convalescence from Type I. pneumonia conditions are adverse to the infecting pneumococcus. But it does not die out completely; some cocci are able to assume the R form. This is not resented by the host, because the R cocci are harmless; it is also a means of self-preservation for the cocci, because, when in the R form, they are not susceptible to the host's specific Type I. antibodies. Not only may they survive in a degenerate condition, they may also reconstitute themselves into another S type (Group IV. or Type III.), possessing less invasive power than Type I., but increased capacity for resistance. As regards the exact conditions under which a pneumococcus may acquire Type I. or Type II. characters in the human air passages and thus become the causal agent of a lobar pneumonia, one can only speculate at present. Local tissue conditions can be imagined, constituting a nidus of infection in which the cycle of change illustrated in the mouse can be brought about.

(To be continued.)

* The significance of rough and smooth variations of bacteria, in so far as it is at present understood, was reviewed in THE LANCET, July 7th, p. 31.

THE PARIS HOSPITALS.—Mr. Loucheur, the Minister of Public Works, has proposed to the Prefect of the Seine that six new hospitals should be erected in the suburbs of Paris to relieve the congestion in the city institutions and to meet the needs of the neighbouring towns. The Minister expresses the opinion that each hospital should have 1500 beds, and that four should be begun without delay. He estimates the total cost at the equivalent of £2,000,000, of which the State will contribute £800,000.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

The New Department of Health for Scotland.

THE Secretary of State for Scotland has designated Mr. John Jeffrey, C.B.E., as the Permanent Secretary to the Department of Health for Scotland and he will probably take up his work towards the end of the year. Meanwhile, the Scottish Board of Health is reduced to two members, one of whom, though due to retire, is retained until the new Department is formally installed. Mr. Jeffrey, the new Permanent Secretary, who is at present Secretary of the Board, has had a long and very varied career in the civil service. He has done a large amount of detailed constructive work. He was secretary of the Macdougall Committee on Scottish Poor-law over 20 years ago, and later was for four years assistant secretary of the Royal Commission on Poor-law and Unemployment. In the recent rating reforms, he had the chief responsibility for the working out of the schemes and he has taken a leading part in preparing the groundwork of the revolution now going on in local government machinery. The appointment of the Chief Medical Officer, on whose relation to the Permanent Secretary, on the one hand, and to the Minister, on the other, the smooth working of the new administration will largely depend, has not yet been made. There is ground for believing that the Secretary of State is fully alive to the importance of maintaining the status of the medical officer of the department.

The Universities.

A year of "quiet progress, not marked by many notable events," in the life of Edinburgh University was surveyed by Sir J. Alfred Ewing, F.R.S., vice-chancellor and principal, at the autumn graduation in the Upper Library Hall on Oct. 20th. At the outset of his speech he referred to the changes in personnel. Prof. G. L. Gulland had retired from the chair of medicine and been succeeded by Prof. W. T. Ritchie. Sir James Walker had laid down his burden as professor of chemistry, and Prof. Kendall had been appointed in his stead. Prof. Sydney Smith had returned from the East to take the chair made vacant by the death of Harvey Littlejohn. During the year one new professorship had been established—that of animal genetics—and had been filled by the appointment of Dr. F. A. E. Crew. Buildings were about to be erected, to the designs of Sir Robert Lorimer, for housing that department, which, meanwhile, found temporary quarters in and about the chemical laboratory. Their cost would be met mainly by grants from the Development Commission and the International Education Board. The work had in fact begun, on a site near that on which Sir Robert Lorimer's new buildings for the department of zoology were approaching completion. These two departments would extend the group, collectively known as the King's Buildings, on the ample area adjoining West Mains-road, where chemistry had already found a permanent and geology a temporary home, and where other scientific departments would in due course be placed. Within the grounds of the Royal Infirmary the laboratory of clinical medicine, which they were able to provide through the generosity of the Rockefeller Trustees, had been built and was now ready for use. During the past year the number of matriculated students was 4349, or 210 more than in the previous year, and nearly 4000 more than it was two years ago. The increase was shared by all faculties except that of science, where there was a slight reduction. The whole number was made up of 3026 men and 1313 women. The faculty of arts alone had more than 2000, with an equal division of the sexes—1052 women to 1093 men. In medicine there were 139 women to 1093 men. A surprising recent phenomenon had been the multitude of applications that came from American students of medicine for admission to that University, after completing a first year of medical study at home. Fully 500 inquiries of that kind had been received since January. That was no doubt a compliment to Edinburgh, but an embarrassing one, for only a few of the applicants could be taken, having regard to the claims of others and to the limited number of places that were available in clinical parts of the curriculum. Room had, however, been found for a few, and they now had about 75 American students engaged in the study of medicine. The University of Aberdeen this session is able to welcome one of her distinguished sons, who has returned to his Alma Mater as professor of physiology. Prof. Low, Dean of the Medical Faculty, in introducing Prof. J. J. R. Macleod, F.R.S., said that he had had a brilliant undergraduate career as a student and was remembered as one of the envied few who possessed, as it were, a photographic memory. After graduating with honours, Dr. Macleod had spent a year of study in the Physiological Institute of Leipzig University. He then joined the staff of the Physiological Institute of the London Hospital Medical School. So quickly had he established a reputation as teacher and research worker that within three years he was invited to become professor of physiology in the Western Reserve University, Cleveland, being called to the University of Toronto in 1918. The whole world knew of his part in the dramatic discovery of insulin, for which jointly with Dr. Banting he had in 1923 been awarded the Nobel Prize for Medicine. Prof. Macleod's inaugural address was published in THE LANCET of Oct. 20th.

Emeritus Prof. W. C. McIntosh, F.R.S., has reached his ninetieth birthday, on which occasion the University of St. Andrews have sent him a congratulatory message. He became natural history professor in the University in 1882, and retired from the chair in 1917. For a considerable period he was a member of the Fishery Board for Scotland and much of his research work has been concerned with food fishes. A keen research worker, Prof. McIntosh still spends much time in the Gatty Marine Laboratory, St. Andrews.

Acute Poliomyelitis in Glasgow.

There has recently occurred an increase in the incidence of acute poliomyelitis in Glasgow. This dates from the beginning of July, since when there have been reported 86 cases in all, with seven deaths. During July there occurred 15 cases; during August, 19; during September, 27; and 25 up to Oct. 20th. The majority of patients are children under 5 years of age. A group of six cases have occurred among scholars of Anette-street School, the last patient sickening on Oct. 12th, since when there has been no further incidence. It is most unusual for a group of cases to occur in association with day schools, and all possible measures have been taken in association with the education authority to prevent any further spread of infection.

The Carntyne Housing Scheme.

Glasgow's newest suburb and the latest contribution by the municipality towards the better housing of the citizens was formally opened on Oct. 24th by Lady Gilmour, wife of the Secretary of State for Scotland. The area affected by this scheme is situated south of Riddrie, in the east end of the city, and part of it is divided by the new Glasgow-Edinburgh road. Covering 261 acres, of which 214 are within the city boundaries, the scheme includes the provision of some 2000 houses of various types, a large number of which are nearing completion.

Bovine Tuberculosis.

A conference is to be convened among the larger urban local authorities in Scotland on the subject of bovine tuberculosis. At a meeting of the Glasgow Corporation held on Oct. 5th this proposal was welcomed, in view of the report of the city veterinary inspector (Mr. A. M. Trotter). His report dealt with

the question of the eradication of bovine tuberculosis, and pointed out that if the disease could be eradicated from one herd, it could also be eradicated from every herd in the country if the hearty coöperation of the Government, stock-owners, and the veterinary profession to this end could be obtained. The question was one that required immediate attention, in view of the limited powers for dealing with diseased animals brought to the city markets. Although they were able to exercise control in their own markets, there was nothing to prevent outlying districts from sending tuberculous cattle for sale or slaughter.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

School Medical Services.

Mr. Richard Mulcahy, Minister for Local Government and Public Health, in an address to a political meeting last week, said that the organising of school medical services provided public health authorities with a vantage point of enormous value not only for the direct prevention and treatment of disease, but for the education of the individual. The modern public health movement had reached its third phase in recent legislation dealing with personal hygiene, the first stage having been principally characterised by the development of waterworks and sewage disposal systems, and the second stage by more effective control over contagious diseases. School medical inspection had been introduced in Great Britain in 1907, but it was not until 1919 that the Public Health Medical Treatment of Children (Ireland) Act imposed this duty on county and county borough councils.

Describing the organisation of school medical inspection in Dublin, Mr. Mulcahy said that out of 10,752 children examined in the city there were only 42 cases of non-pulmonary tuberculosis, 20 of definite pulmonary tuberculosis, and 18 of suspected pulmonary tuberculosis, being less than 0·8 per cent. of the children inspected. Rickets appeared to be almost non-existent where, because of poverty and other causes, much of it might have been expected. So also was personal uncleanliness. The principal defects were shown to be: dental caries, 5336 (or 46 per cent. of the children inspected); tonsils, adenoids, &c., 2248 (21 per cent.); eye defects, 2609 (24 per cent.); malnutrition, 594 (5·5 per cent.). He commenced by speaking of the steps that had been taken in other areas to establish schemes of inspection of school-children.

Insanity in the Irish Free State.

The annual report of the Inspectors of Mental Hospitals in the Irish Free State for 1927 states that the number of insane persons under care at the end of the year was 20,042. Of these 16,409 were in district mental hospitals, 425 in auxiliary mental hospitals, 1834 in poor-law institutions, 807 in private mental hospitals, 156 in single care, 115 in Dundrum Criminal Lunatic Asylum, and 296 in institutions for mental defectives. There was a net increase of 155 during the year. The proportion of insane in different areas varies greatly. It is highest in County Waterford, where the rate is 9·29 per 1000 of the population, and lowest in County Donegal, where it is only 4·56. The three lowest rates are found along the western seaboard, in the counties of Donegal, Mayo, and Kerry. The inspector suggests that the rates as given may be misleading, as they only reflect the proportion of insane under care, and not that of the total insane. He thinks that in the more rural counties there are many insane who never come under care. Although the number of insane continues to increase, there has been ever since 1922 a continuous decrease in the number of annual admissions. The total number of deaths during the year was 1069. Of these, pulmonary tuberculosis was responsible for 17·9 per cent., epilepsy for 3·4 per cent., malignant disease and other tumours (except of the brain), 2·7 per cent.; and general paralysis of the insane, 0·7 per cent. Enteric fever occurred during the year in nine mental hospitals, and caused 21 cases and 2 deaths in Ballinaslae, and 33 cases and 6 deaths in Mullingar. Dysentery caused 7 deaths, of which 5 occurred in Limerick. The average cost per patient in the district mental hospitals (deducting repayment of loans and other miscellaneous receipts from gross expenditure) was £44 4*s.* 2*d.*

Ulster Medical Society.

The opening meeting of the session was held in the Medical Institute, Belfast, on Oct. 25th. The outgoing President occupied the chair at the commencement of the proceedings and inducted to it Dr. T. H. Milroy, professor of physiology in the Queen's University of Belfast, investing him with the presidential chair and medallion. The newly installed President expressed the thanks of the Society to Dr. J. C. Rankin for his dignified conduct in the chair during the past session, and to him and Miss Rankin for their hospitality and kindness to its Fellows and Members; he then referred to the loss the Society has sustained during the year in the deaths of Dr. W. G. Mackenzie, Dr. J. S. Darling, Dr. T. A. Davidson, and Dr. H. L. M. McKisack.

Prof. Milroy's presidential address dealt with physico-chemical adjustments of the body, with particular reference to the blood. He showed how the properties of body tissues and fluids might be regarded as mainly due to the existence of colloids in various degrees of solution, and how the separation of these colloidal particles in a dispersion medium is bound up with the electrical configuration of the system, as illustrated by the behaviour of red cells, which are negatively charged, in isotonic electrolyte-free solution; if to such a suspension a trivalent anion such as lanthanum were added, the cells agglutinated and the sedimentation-rate increased, the molar concentration of the lanthanum required to neutralise being the measure of the negative charge of the cells. Adjustments between the red cells and the plasma were next considered, and the permeability of the red cell capsules compared with that of collodion membranes; it was shown that while red cells are normally permeable only to anions, permeability to kations might be experimentally produced. This anion permeability permitted the exchange of bicarbonate ions formed in the red cells with the chloride ions of the plasma. Attention was then directed to the part played by blood pigments in adjustments of the reaction of the blood; in the transformation of part of the oxyhæmoglobin to hæmoglobin, base was set free as hæmoglobin was a weaker acid than oxyhæmoglobin; the larger part of base was thus secured by the entering carbonic acid without any change in reaction. The adjustments in reaction brought about through variations in the activity of the respiratory centre, and by the removal of excess of fixed acid or base by the kidneys, was briefly dealt with, and compensated types of acidosis compared with uncompensated.

Mr. T. S. Kirk moved, and Dr. J. E. MacIlwaine seconded, a vote of thanks for the address.

MOTORISTS AND ACCIDENTS.—The Royal Automobile Club announces that it is endeavouring to secure subscriptions from clubs and individuals interested in motoring for the benefit of hospitals situated on or near main roads which have special calls upon their services in respect of motor accidents.

ORMSKIRK COTTAGE HOSPITAL.—Miss Margaret Beavan, Lord Mayor of Liverpool, has laid the foundation-stone of an extension of this institution. It includes a new children's ward, an enlarged men's ward, an anæsthetic room, a convalescent ward roofed with Vita glass,* and modernised domestic and nursing quarters.

Public Health Services.

INVESTIGATION OF MATERNAL DEATHS.

AN OFFICIAL INQUIRY FORM.

THE Committee of the Ministry of Health on Maternal Mortality, of which Sir George Newman is chairman, has issued an inquiry form for the guidance of medical officers of health in making full investigation of every maternal death in childbirth. The suggestion is that a copy of this form with the accompanying explanatory note should be sent to each private practitioner in the district inviting his collaboration. All information given will be treated as strictly confidential and used whether by the medical officer or by the Ministry for public health and scientific purposes only; any mention of person, place, or institution which might lead to identification will be omitted in the report. It is assumed that the medical officer of health who makes the inquiry will not be engaged in private practice, and will be assisted by an obstetric specialist, or—should there be no such recognised in his district—by one or more practitioners nominated by the local division of the British Medical Association. When a parturient woman dies in hospital or other institution the authorities will be asked to furnish the necessary information. In private cases inquiry will include an interview between the practitioner and the medical investigator, any appearance of criticism being scrupulously avoided, for an accoucheur is already more than sufficiently harassed by the occurrence of a death in his practice. On the inside pages of the inquiry form are scheduled every common cause of maternal death, various questions under each heading being intended to suggest the appropriate lines of inquiry; and on the fourth page is space for comment by the medical investigator and by the practitioner in charge. The latter will be entitled if he wishes to see the findings of the medical investigator before the report is formulated finally for the Ministry. So far as this inquiry entails added expense the Ministry of Health is prepared to approve any reasonable expenditure, and the Ministry is desirous of having the reports submitted as soon as they are complete without waiting for the usual quarterly report of the department.

THE DORSET INSURANCE COMMITTEE INQUIRY.

NEARLY a year ago the Insurance Acts Committee took the unprecedented step of addressing to the Minister of Health, through the deputy medical secretary of the British Medical Association, a letter of protest and complaint against the treatment received by the Dorset insurance practitioners from the clerk to the Dorset Insurance Committee. The allegations in the letter were eventually investigated at a local inquiry held at Dorchester in the last days of June by Mr. Michael Heseltine. Towards the end of August his findings and recommendations were reported to the Ministry and these have lately reached us. The report is a lengthy document; it deals patiently with every issue raised during the proceedings.

A rather vague allegation in the deputy medical secretary's letter, to the effect that the clerk to the Dorset Insurance Committee had acted as informer, prosecutor, and, so far as possible, adjudicator, in medical service subcommittee cases, is held not to have been established. A point of more general importance had been raised by a resolution of the insurance committee a year ago recommending that any practitioner applying for admission to the medical list, or giving notice of change of address, should be asked to give details of the surgery and waiting-room accommodation he would provide. Section 24 (2) (*b*) of the National Health Insurance Act directs that the Medical Benefit Regulations are to require the adoption by every insurance committee of such a system as will secure to any duly qualified practitioner who is desirous of being included in the medical list the right to be so included. Mr. Heseltine observes that, if the Dorset Committee's resolution purported to impose an obligation on the practitioner, it would be contrary to law and unenforceable. Another matter of general interest was the disputed interpretation of the amount of discretion exerciseable by the chairman of the Medical Service Subcommittee in dealing with questions which stand referred to the subcommittee under paragraphs (1) and (2) of Article 28 of the Medical Benefit Regulations and also in dealing with cases which may be treated as questions standing referred under the article in accordance with paragraph (3) of Rule 6 of the Dorset Rules and Procedure for the Administration of Medical Benefit. Mr. Heseltine declares as a matter of law that the chairman has a reasonable measure of discretion in dealing with questions which must be investigated by the subcommittee under Article 28 because the category of cases in which the "statement or statements of the complainant do not disclose any prima facie ground of complaint" is sufficiently wide to enable the subcommittee to dispense with a hearing in cases of such a character that reasonable men would consider it proper to do so. The significance of this part of the proceedings was that the local practitioners considered—and the chairman himself apparently agreed—that his discretionary power of dispensing with hearings had been unreasonably restricted; Mr. Heseltine finds as a fact that this was so, and that the restriction was at any rate partly due to the clerk's failure to deal regularly and equitably with statements and communications addressed to the insurance committee by or on behalf of insured persons. Another issue raised at the Dorchester inquiry was this: If a practitioner charges a fee to an insured person and, having found that he has made a bona fide mistake, returns to the insured person the amount of the charge made, must the case go as a routine matter for hearing before the Medical Service Subcommittee in view of paragraph 7 (3) of the Terms of Service for Practitioners? To this question Mr. Heseltine's report replies that it is neither necessary nor proper that such a case should go to a hearing "as a routine matter." Finally, a personal, rather than a general matter, there had been considerable irritation among local insurance practitioners at the character of the clerk's correspondence with them, his letters being criticised as abrupt, irritating, and sometimes offensive. Here the finding is that the clerk's conduct in certain cases in this respect was unbecoming in an officer of a public body.

The findings and conclusions in the Dorset inquiry have been set out above in some detail partly for their general interest and partly because they justify the unusual action taken by the Dorset insurance practitioners in pressing for an inquiry. It will be the general wish that the controversy should now end. Assurances have been given, the report states, on behalf of the clerk to the Dorset Insurance Committee. The practitioners will be ready to forget the past and to do their utmost to ensure the smooth and efficient working of the health insurance system in the future.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED OCT. 20TH, 1928.

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 128 (last week, 162); scarlet fever, 2997 (last week, 2984); diphtheria, 1237; enteric fever, 52; pneumonia, 1136; puerperal fever, 62; puerperal pyrexia, 108; cerebro-spinal fever, 7; acute poliomyelitis, 14; acute polio-encephalitis, 1; encephalitis lethargica, 29; dysentery, 4; ophthalmia neonatorum, 102. No case of cholera, plague, or typhus fever was notified

during the week. There is little further increase in scarlet fever, and enteric fever continues to diminish.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Oct. 23rd–24th was as follows: Small-pox, under treatment 6, under observation 1; scarlet fever, 2583; diphtheria, 1747; enteric fever, 38; measles, 80; whooping-cough, 271; puerperal fever, 23 (plus 14 babies); encephalitis lethargica, 69; poliomyelitis, 2; "other diseases," 21. At St. Margaret's Hospital there were 10 babies (plus 4 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 3 (2) from enteric fever, 9 (0) from measles, 10 (2) from scarlet fever, 27 (7) from whooping-cough, 36 (5) from diphtheria, 102 (26) from diarrhœa and enteritis under two years, and 55 (6) from influenza. The figures in parentheses are those for London itself.

The fatal case of enteric fever outside London was reported from Ealing. (There was no death from small-pox in the returns received from the whole of England and Wales for the month of September last.) Three fatal cases of measles were reported from Liverpool, 2 of scarlet fever from Leicester, and 3 of whooping-cough from Sunderland, while West Ham, Manchester, Salford, and Leeds reported 2 each. The deaths from diarrhœa and enteritis under two years show no reduction; Liverpool still has 10 to report, Stoke-on-Trent and Birmingham 5 each, West Ham and Manchester 4 each.

The number of stillbirths registered during the week in the great towns was 265 (corresponding to a rate of 41 per 1000 births), including 42 in London.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are 1927 statistics of three large cities and a county borough.

Name of city or county borough and estimated (R.-G.) population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Diarrhœa, &c., under 2 years.	Maternal mortality from childbirth.
Leicester .. .. (245,000)	16·2	12·4	1·46	1·47	2·0	1·6	77/37	8·7	4·0
Leeds .. .. .. (477,600)	16·3	13·0	1·17	1·36	2·2	2·1	81/35	11·3	4·9
Bradford .. .. (293,200)	14·7	14·6	1·00	1·53	3·4	1·4	94/36	7·6	6·7
Oldham .. .. (141,400)	14·6	14·4	0·89	1·55	3·5	1·6	86/48	6·7*	11·0

* Under 1 year only.

The pre-school mortality-rates per 1000 births were: Leicester, 39; Leeds, 47; Bradford, 50; Oldham, 36.

Leicester.

Dr. C. Killick Millard refers to the report issued by the Ministry of Health during 1927 as the outcome of an investigation by a departmental committee on the use made of the beds in isolation hospitals. It is there pointed out that under present conditions, and on general public health grounds, too many beds are being reserved for scarlet fever patients, and that some of this accommodation could be more profitably used for such ailments as measles, pneumonia, and infectious diseases of the nervous system. The Leicester Health Committee, after explaining the position to the medical profession in Leicester and inviting their coöperation, have effected a gradual reduction in the percentage of scarlet fever removals. The proportion of removals, which averaged about 64 per cent. before the new arrangement was adopted in September, was reduced to 45 per cent. for the last four months of 1927, and to 42 per cent. for the first quarter of 1928. Out of 620 scarlet fever notifications in 1927 there were only 3 fatal cases, indicating the mildness of the disease.

A cancer-control clinic is held on one evening a week at the health offices by the honorary surgeons of the Royal Infirmary. The clinic is not for treatment, but for diagnosis and advice only, and to begin with it is concerned with affections of the breast and uterus. A patient may be referred to her own doctor, advised to return for re-examination, or recommended for admission to the Royal Infirmary. Various methods have been adopted to advertise the clinic. Of 60 cases attending during the six months 36 were found not to be cancer and 5 were asked to return, 5 were referred to their own doctor, and one case went to a private hospital. Twelve cases were recommended to the Royal Infirmary, of whom 11 were admitted at once and one was dealt with as an out-patient. Of the infirmary cases, 3 were found to be cancer of the breast and operated on.

Charts are given showing the attendance of males and females at the venereal diseases clinics since 1917. In the case of males the new cases of gonorrhœa have always exceeded those of syphilis. The peak for both diseases was reached in 1919, and a second lesser peak is indicated in 1926. In the case of females syphilis cases have always exceeded gonorrhœa until the three years 1925–27. The peak for syphilis was reached in 1921 and the peak for gonorrhœa in 1926. Dr. Millard is not in the least satisfied with what we are doing to prevent these diseases and devotes considerable space to discussing the "tragedy of venereal disease." During 1927, of 354 new male patients with gonorrhœa 134 were married, and of 95 with syphilis 57 were married. He gives particulars of individual cases seen at the male and female clinics from which the most disastrous results can be inferred. No doubt he is right in thinking that the public do not appreciate these tragedies, and that publicity through the press and the distribution of copies of his report to the public libraries is much to be desired.

Dr. Millard refers to the great value of the municipal housing schemes and to progressive improvements as the result of experience. It is essential, he says, that the present housing policy should be continued long enough and not abandoned as soon as the more urgent demand is satisfied. The housing schemes raise the whole standard of housing for the working class, and enable the worst of the existing old houses to be closed, but they fail to help persons, who are unable to pay the rent fixed or who have such a large family that a corporation house cannot accept them, or who are undesirable on the ground of personal character. He accepts the position that corporation houses must entail as little charge on the rates as possible, that the housing committee cannot make a distinction in the rates charged to different tenants, and that they cannot jeopardise their new housing estates by lowering the standard as regards the character of their tenants. He suggests, however, that the Health Committee, apart from the Housing Committee, might have the letting and control of a certain number of corporation houses, which should be located quite apart from other corporation houses. The Health Committee, being specially concerned with the poorest stratum of the community, might differentiate between tenants. The Housing Committee naturally want good tenants, while the Health Committee want to assist those most in need of assistance as regards overcrowding. A further suggestion which he makes is that the Leicester Corporation might do much in the matter of reconditioning old houses. Hitherto it has done nothing.

Of the 298 infant deaths 148—i.e., half—occurred in the first month and 107 during the first week.

Success is claimed by Dr. Stanley Banks for the treatment of severe cases of diphtheria at the isolation hospital by the use of much larger doses of serum and its administration intravenously. This was described by Dr. Banks and Dr. G. McCracken in THE LANCET of July 7th, p. 4. The need for steps to be taken to prevent hospital wards being burdened with cases of bacterial diphtheria devoid of clinical signs of the disease is discussed, though Dr. Millard

thinks Leicester does not suffer as much as Birmingham or the M.A.B. hospitals in this respect.

Leeds.

Dr. J. Johnstone Jervis deplores the fall in the birth-rate, which was in 1927 the lowest ever recorded in the city's history. He has much to say against the birth control movement and in favour of large families. In discussing the housing question, however, he mentions that landlords will not accept large families as tenants, so it is to be hoped that he is able to persuade his corporation to give a preference to large families when allocating municipal houses. Since 1920 5280 houses have been built by the corporation and 5588 by private enterprise, but the list of applicants "shows very little sign of diminishing." "The poorer paid worker, of whom there is a considerable number, has not been catered for and still continues to occupy the low-rented inferior dwelling in the congested parts of the city and to crowd into houses already carrying more than their quota of occupants. It is in connexion with the housing of this class that the need to-day is most urgent." During the year some progress was made with the West-street unhealthy area, and it is hoped shortly to build houses on existing housing estates for the tenants evicted therefrom. This area only touches the fringe of the question, however, and there are many others almost as bad calling urgently for attention. The serving of notices for overcrowding is in very many instances entirely futile. At the end of the year the houses in the city numbered 121,620, of which 77,652 were back-to-back houses and 43,968 "through" houses. A table of the causes of death gives the somewhat surprising result that 3869 of the deaths occurred in the back-to-back houses and 2305 in the through houses. The first public washhouse in the city has just been opened and is a great boon, especially to the occupants of back-to-back houses. In the case of the older back-to-back houses the conveniences are trough closets and ash-pits at intervals down the street. Photographs are given showing that bedrooms may be situated over the conveniences and that the occupiers of the furthest off houses may have to walk 60 yards down the street before reaching their conveniences. The only solution appears to be the demolition of two houses in the middle of the block, so as to provide a yard for modern water-closets and ash-bins, in place of the old trough closets and ash-pits.

There is always a long list of cases awaiting admission to the Leeds General Infirmary, and a welcome addition to the hospital accommodation of the city is being made by opening the wards of the two poor-law hospitals for patients willing to pay the very moderate charges levied by the guardians. A full staff of consulting physicians, surgeons, and specialists will be available for the treatment of the patients. The maternity hospital, which last year admitted 1250 confinement cases, is to have its available beds increased to 100, and the new wards are in course of erection. In the tuberculosis scheme there has always been a shortage of beds for surgical tuberculosis. Plans are being prepared for the erection of a children's hospital with 200 beds on the Elmet Hall Estate, which will provide not only for surgical tuberculosis, but for other orthopædic treatment and the nutritional disorders of infants. Another interesting development in the tuberculosis scheme is the taking over by the corporation of the "Factory-in-the-Field" started by the Tuberculous Ex-Service Men's Society. This will afford much needed facilities for offering men and women, disabled by pulmonary tuberculosis, remunerative employment of a suitable kind under the best conditions.

A table shows the increase in deaths from street accidents. In 1911 and 1912 there were 17 and 14 respectively, while in 1926 and 1927 there were 62 and 57. Over 90 per cent. of last year's accidents were due to motor vehicles, and the greatest increase appears to be at the age-periods 45 to 65.

Dr. Jervis thinks there has been a further decrease in the smoke pollution of the atmosphere. This may be partly due to bad trade, but chiefly to improved stoking, the substitution of electric for steam power, and the extended use of smokeless domestic appliances. The West Riding Regional Committee has directed its attention during the year to the drafting of by-laws defining black smoke, dense smoke, and standards for smoke emission; to the introduction of smokeless appliances for cooking and heating in new buildings, and to the issue of certificates to engineers and stokers who have passed certain tests.

There are no producers of graded milk from tuberculin-tested cows. The average cow population of the city is 2188, and among them 19 tuberculous animals were found, 4 with tuberculosis of the udder, 6 with emaciation, and 9 otherwise affected. There were 59 cases of small-pox with no deaths. Ten of the cases occurred among the 4000 employees of a clothing factory. In the first case the patient had been actually at work when in the eruptive stage and with an output of 3000 suits per day it was impossible to say which garments had been handled by infected persons. There is some evidence, however, that the final steam pressing and ironing has considerable disinfecting power, the Hoffman steam press used for the cheaper garments being more efficacious in this respect than hand pressing by hot irons used for the better-class clothing. Dr. Jervis records an increase in the gonorrhœa cases attending the venereal diseases clinics, which he mentions has been observed all over the country. Coincidentally there was an increase in the notifications of ophthalmia neonatorum, 86 cases in 1927 as compared with 73 in 1926 and 50 in 1925. Dr. Jervis emphasises the need for a closer liaison in Leeds between the antenatal clinics and the V.D. clinics, so that pregnant women may secure treatment. Of the 86 cases notified in 1927, 5 of the babies died, and of the 81 survivors 4 had the sight of both eyes affected, while 2 made an imperfect and 75 a perfect recovery.

Bradford.

Dr. J. J. Buchan reports that there is much serious overcrowding, and that at the end of the year the number of applicants for new houses was approximately 2784, 658 of whom were living in apartments. During 1926 2193 new houses were erected and during 1927 2029. During 1927 1115 new municipal houses were occupied and at the close of the year 988 were in course of erection. Some progress was made during the year in demolishing buildings and clearing the site for the "White Abbey" improvement scheme. Under the Bradford Corporation Act, 1925, power is given for the compulsory removal of persons physically unable to look after their homes and this power was used in the case of an enfeebled woman of 75 years. There was a considerable increase in the work of the dental scheme as compared with previous years.

The city cows numbering 3238 undergo regular veterinary inspection and among them 16 tuberculous cows were found, of which 5 were affected with tuberculosis of the udder. The bacteriologist's report shows that 373 samples of milk were examined for tubercle and 6·4 per cent. were found to be infected. It is pointed out, however, that some of the samples were duplicated and that no definite conclusion should be drawn as to the prevalence of tuberculous infection in the milk-supply. The examination of samples of shell-fish showed that "the majority of mussels and cockles are heavily polluted," and the examination of samples of ice-cream indicated that "further control of this industry is highly desirable in the interests of public health." On the other hand, 18 samples of watercress from ten sources were all reported as "good."

Diphtheria was more prevalent than in 1926. There were 340 cases with 35 deaths—a fatality-rate of 10·3 per cent. The Schick test is not employed in the city. There were 51 notifications of small-pox with no deaths. Efforts to prevent the spread of infection were hampered by the refusal of the majority of contacts to submit to vaccination. A chart shows that the male death-rate from pulmonary tuberculosis

is always much higher than the female and was almost double in 1927.

The Bradford Corporation have powers under a local Act of 1925 for compulsory notification of venereal diseases and it is believed that these powers have not deterred persons from seeking treatment, but have operated rather in securing better treatment. The records of 1927 point to a decrease in syphilis and an increase in gonorrhœa. During 1927, with the full coöperation of the medical profession, arrangements were made for the supervision and following up of all cases of malignant or suspected malignant tumour. Midwives attended about 74 per cent. of the births and sent for medical help in 15 per cent. of their cases.

Oldham.

Dr. James B. Wilkinson reports that the orthopædic institute, generously presented by Mr. R. Greenhalgh, has done good work, especially in the light treatment of rickets. Two ladies have presented to the town a large house, which was used as a hospital during the war and which is now fitted up as a first-class nursing home. Another large house has been purchased for adaptation as a much needed municipal maternity home with 12 to 14 beds, and will shortly be ready to receive patients. During the year the scheme for the substitution of sanitary bins for ash-pits was completed. A good deal of trouble is caused by the blockage of waste water-closets, which number 24,780. At the last census there were 34,781 houses and 34,755 families or separate occupiers. The houses let in lodgings and furnished rooms are being gradually reduced in number. An unhealthy area, which is at present being dealt with, consists very largely of this type of house, and as the houses are closed the tenants are offered accommodation on the new housing site at Greenacres. Dr. Wilkinson states that in the majority of cases these tenants are trying to live up to the improved standards which their surroundings allow. Antenatal work is as yet on a small scale, the centre being attended by 104 cases, while the births numbered 2095. The stillbirths notified numbered 134, equivalent to 6·4 per cent. of the live births—a high percentage. There was a decline in the new cases of syphilis and an increase in the new cases of gonorrhœa at the V.D. clinics. There were 19 cases of small-pox in connexion with a poor-law institution. Most of the cases were in men over 60 and of a mild type, but one death of a man of 62 was attributed to the disease. Dr. Wilkinson puts forward what he calls the heretical suggestion that, in view of the enormous expense at present undertaken and of the mild type of the disease, this ailment might be treated like chicken-pox. The cases would be isolated at home and people would have the choice of escaping the disease by vaccination or of contracting it.

EAST SUFFOLK AND IPSWICH HOSPITAL.—A new pathological department was opened by Princess Mary (Viscountess Lascelles) on Oct. 20th. The site upon which the new block is erected is at the north-east corner of the hospital property. The laboratory actually stands on the site of the stables and the coach-houses of Waveney House—the house which has been reconstructed and adapted as a residence for the pathologist. The ground floor is devoted to a museum for pathological specimens, a consulting-room, a waiting-room for patients, lavatories for the staff and for patients, and a store-room. There are also outside offices and accommodation for carrying on serological and inoculation investigations. The first floor is divided into five rooms and offices. The general laboratory—a room measuring 30 feet by 18 feet—is so constructed as to obtain cross light and ventilation; a portion of the room partitioned off in plate glass will be used as a vaccine preparation room. Autoclave and sterilising rooms are provided adjoining the section cutting department. A biochemical laboratory and a dark room specially fitted for photographic work in connexion with the pathological specimens complete the block. Dr. Eric Biddle, who is in charge of the department, has been granted a sum sufficient to enable him to instal modern apparatus of the best workmanship, and it is considered that the equipment will enable the laboratory to deal with all the work which may be reasonably required, not only by the hospital itself but by private practitioners and local authorities in the area served by the hospital.

Correspondence.

"Audi alteram partem."

VACCINATION REFORM.

To the Editor of THE LANCET.

SIR,—The whole argument in Dr. Carr's able letter in your last issue is vitiated by his continued refusal to face the probability of the future reintroduction of severe small-pox into this country, or the reversion of the present mild to a severe type, as I showed in my last letter, has repeatedly occurred recently in America, although he admits the possibility of these occurrences. He is also wise in admitting the very slight danger of vaccination, for this was also proved by the recent Rolleston Committee Report in which it was shown (1) that after a minute inquiry into the allegations of the antivaccinists the Royal Commission on Vaccination of 1889–96 concluded, regarding the ill-effects of the measure, "when considered in relation to the extent of vaccination work done they are insignificant"; (2) the very few deaths following, but by no means necessarily due to, vaccination have been reduced in recent years to one-third of the former "insignificant" rate; and (3) the nervous sequelæ Dr. Carr deplores nearly all occur in primary vaccinations *after infancy*, so are mainly due to the neglect of primary infantile vaccination, and an argument in favour of increasing, not decreasing, the relatively safe and more convenient vaccination during the first year of life. If we are to abandon every advance in medical science, including vaccination, because it is occasionally attended by ill-results, we shall have to revert to the safe, if vain, uncivilised method of wearing charms as a protection against disease and death.

I welcome Dr. Carr's mention of the "mild" small-pox outbreak in Gloucester in 1923, as it enables me to point out that with upwards of 500 patients each "mild" case cost the city £200, and the loss of local trade was estimated at £20,000 a week. With between 10,000 and 15,000 cases yearly during the last three years in England and Wales the total preventable waste of public money must amount to a far larger sum than the country can afford. As Dr. Carr admits that isolation and vaccination of contacts, through a costly agency not required in well-vaccinated Germany, is necessary to control each "mild" small-pox, this burden will increase greatly with the further neglect of primary vaccination he advocates. I showed early this year that the disease has increased 66-fold in six years in this country, and last winter three times as many counties were affected as in the previous year, while the last two weeks' returns show an ominous commencement of the usual winter rise with an increase from 94 to 162 cases; so with the continued spread of the disease, most people will have to be vaccinated sooner or later, and some employers of labour have recently found to their cost that the only insurance against serious business losses due to "mild" small-pox is to employ only vaccinated persons. Is it not, therefore, wiser to close the stable door before the horse is stolen?

Lastly, the interesting suggestion of the Rolleston report to use the milder American multiple puncture method of vaccination will doubtless receive the careful consideration of the public health authorities, although its weak point is that we do not yet know for how long it affords protection, but it does indicate the right solution of the problem. This in my humble opinion is not to bank on Dr. Carr's assurance that we have nothing to fear in future from severe small-pox in this country, and consequently we should at once throw away our one sure weapon against this relentless foe, just because at the present time his attacks are individually much weakened, although he is numerically far stronger. On the contrary, I

confidently submit to the medical profession the policy of maintaining unimpaired our well-tried defences of primary infantile vaccination, supplemented during small-pox outbreaks by revaccination; and at the same time press forward the researches of the scientific workers of the Rolleston Committee with a view to eliminating any remaining inconveniences and ill-effects of primary vaccination. For my own part I am content to leave it at that.

I am, Sir, yours faithfully,

LEONARD ROGERS, Lt.-Col. I.M.S. (Retd.).

South Hampstead, N.W., Oct. 28th, 1928.

HEART FAILURE IN BERI-BERI.

To the Editor of THE LANCET.

SIR,—This is to thank you for publishing Prof. K. F. Wenckebach's lecture on Heart and Circulation in a Tropical Avitaminosis (Beri-beri) in your issue of August 11th last. By the practical method of "trial and error" I have found that, as a result of treating some hundreds of cases, heart stimulation with digitalis is worse than useless in cases of beri-beri. Though beri-beri is most common among eaters of polished rice, one of the worst cases treated was a European who lived for over a month on tinned food whilst on a surveying journey. The water-retention hypothesis is strongly borne out by the fact that large doses of magnesium sulphate given daily are very beneficial to beri-beri patients. This in conjunction with ordinary yeast as used by most cooks in the tropics for breadmaking, in one ounce doses three times a day, and a diet including green peas (*katjang idjoe*) mixed with the rice, and other foods containing vitamin B, such as marmite, will render a beri-beri case physically fit for work within three weeks. To deprive a Chinese of rice makes him miserable, but if "katjang" is mixed with it he is contented. Where freshly made yeast is not obtainable, dry yeast spores in the form of pills may be given with benefit, up to about grs. 30 daily.

Till this form of treatment was adopted beri-beri cases often remained in hospital for two or three months, instead of the two or three weeks now required. A dynamometer is useful as an index of progress. On admission a beri-beri patient usually cannot exceed a grip pressure of 30 kg., and at the end of a fortnight under yeast treatment from 60 to 80 kg. may usually be registered.

I am, Sir, yours faithfully,

A. S. TUXFORD.

Central Hospital, Lahad Datu, B. N. Borneo, Sept. 19th, 1928.

"HYPERVITAMINOSIS."

To the Editor of THE LANCET.

SIR,—The letter of Mr. L. J. Harris and Mr. T. Moore in your last issue and your annotation of the previous week (p. 827) seem to me to raise questions of some practical as well as scientific importance.

From some work which has been carried out in this laboratory, it appears that the deleterious influence of irradiated ergosterol in excessive doses is not entirely due to vitamin D itself, since the toxic effect is not proportional to the antirachitic activity.

In these experiments, some of which are still in process, I find that young rats given a complete synthetic diet similar to that described by Drummond and Watson (*Analyst*, June, 1922) in which is incorporated ergosterol, *irradiated in a non-volatile solvent*, to the extent of 0·1 per cent. fail to grow, and die after about two months; similar results are obtained with 0·05 per cent., but 0·025 per cent. permits of almost normal growth. Older, but still growing, rats also respond to the diet containing 0·1 per cent. with cessation of growth. Incorporation of 0·1 per cent. non-irradiated ergosterol does not delay growth, or only to a slight extent. These results in general confirm those obtained by Mr. Harris and Mr. Moore. With 0·025 per cent. irradiated ergosterol present in the diet the number of antirachitic "units" (K. H. Coward, *Quart. Jour. Pharmacy*, 1928, i., 27) supplied per 100 g. diet, as determined by separate experiments, is about 200,000. The amount of vitamin D consumed per diem is, therefore, about 10,000 times greater than that necessary to prevent rickets in this animal.

In contrast to the relative harmlessness of these large doses of this material, it has been found that ergosterol, irradiated under different conditions and necessarily submitted to further manipulation, may have much greater deleterious effects, although the antirachitic activity may be less than one-twentieth of that of the irradiated ergosterol used in the other series of experiments. Young rats on such a diet die within a week or so; older rats show a marked loss of weight, from which, however, recovery can ensue if the intake of the excessive amount of ergosterol be stopped.

Two inferences may be drawn, in my opinion, from the work published on D-hypervitaminosis: first, that preparations containing this vitamin should be standardised in terms of some stable standard preparation, such as that used by Dr. Coward (loc. cit.); and, secondly, that the deleterious effects described are produced by doses so enormous that the clinician need not fear the production of toxic effects from the administration of therapeutic doses of ergosterol properly irradiated. After all, many articles of diet are injurious when taken in excess; usually from the mere nature of the foodstuff it is impossible to consume more than a slight excess, and it is only with the concentration of essential elements in highly active forms that any danger of over-consumption can arise; but it would seem to be about as wise to restrict the use of irradiated ergosterol from fear of harmful effects as to give up the use of common salt because of its unpleasant effects when taken in excess.

Accurate standardisation of vitamin D activity, of course, will prevent not only the administration of too large a dose in error, but also that of too small a dose with the resulting failure of therapeutic effect.

I am, Sir, yours faithfully,

S. W. F. UNDERHILL, M.A., B.M., B.Ch.,
Director, Physiological Laboratories,
The British Drug Houses Limited.

London, N., Oct. 30th, 1928.

TESTING FOR COLOUR-BLINDNESS.

To the Editor of THE LANCET.

SIR,—I have been greatly annoyed to find my name on caricatures of my lantern. One lantern had actually a yellow glass labelled purple. All authorised lanterns are accompanied by a certificate signed by me stating that they are correct. I understand that a number of unauthorised "Edridge-Green lanterns" are being used in India.

Indian papers please copy.

I am, Sir, yours faithfully,

F. W. EDRIDGE-GREEN.

Walm-lane, Willesden-green, N.W., Oct. 28th, 1928.

WELFARE WORK AND THE PRACTITIONER

To the Editor of THE LANCET.

SIR,—In reply to your correspondents "Algy" and "C. D." may I submit that in a school medical service and in an infant welfare service respectively, controlled by a common-sense perspective, the circumstances described in these two letters could not arise.—I am, Sir, yours faithfully,

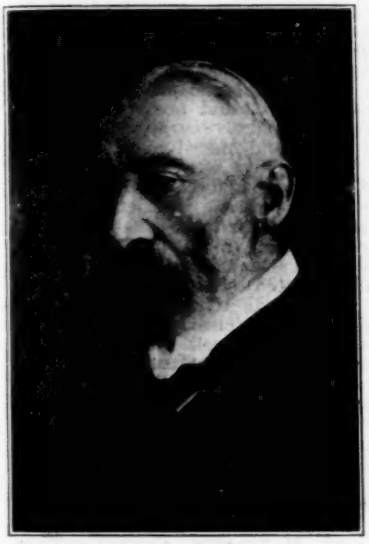
R. J. MAULE HORNE,
Medical Officer of Health, School Medical Officer
M.O. in charge Child Welfare,
Oct. 27th, 1928. Poole, Dorset.

Obituary.

SIR CHARLES SISSMORE TOMES, L.D.S., F.R.C.S. ENG., LL.D., F.R.S.

THE death of Sir Charles Tomes, which took place at Aylsham, Norfolk, on Oct. 24th, closes a period of more than three-quarters of a century during which the name of Tomes has been honoured by dental practitioners, not only in this country, but the world over. Sir John Tomes, who commenced the study of dentistry as a pupil of T. Fairley Smith nearly a hundred years ago, was one of the founders of modern dentistry, and the names of Tomes, father and son, will stand along with that of Pierre Fauchard in the dental surgeons' roll of honour.

Charles Sissmore Tomes was born in London on June 6th, 1846, and went to school at Radley, where he distinguished himself at rowing as well as in other ways. Following in his father's footsteps he entered Christ Church, Oxford, as a commoner, and in 1866 took the only first-class of his year in the Natural Science School. From Oxford he went on to the Middlesex Hospital where his father was then surgeon-dentist, qualifying M.R.C.S. and L.D.S. in 1869. At that time histology was practically a new subject and inspired by Charles Robertson, his Oxford teacher, Tomes began to devote his spare time to research, chiefly histological, the results of which, published for the most part in the Philosophical Transactions, led to his being elected a Fellow of the Royal Society at the early age of 32. It was in the same critical spirit that he approached problems more intimately connected with his daily work, and his observations and laboratory experiments disclosed facts of great value which are to be found recorded in dental journals, sometimes as papers, more often as contributions to discussions. Other workers sought his help and his work proved an incentive to such followers as the late Howard Mummery. Tomes was early appointed lecturer on dental anatomy to the (Royal) Dental Hospital of London, and his lectures were embodied in a Manual of Dental Anatomy which passed through many editions and was for long a standard work. He examined in dental surgery at the College of Surgeons for 14 years.



SIR CHARLES TOMES, F.R.S.

For many years Charles Tomes practised as a surgeon-dentist in Cavendish-square, at first with his father and later with Mr. E. G. Betts and Sir Harry Baldwin. Although too fully occupied to take an active part in political matters, his opinion was often sought concerning them. His mind was indeed more fitted to the giving of considered judgments—often of great value—than to taking part in public discussion, although he was keenly interested in all that concerned the welfare of his profession, and presided for a time over the British Dental Association. His appointment in 1898 to the General Medical Council, as a Crown nominee, was very welcome to his fellow practitioners who previously were unrepresented on the Council, though subject to its jurisdiction. He gained the confidence and friendship of members of the Council and was elected a treasurer in 1904, holding this office until his resignation from the Council in 1920, having been granted a knighthood the year previously. During his period of office the Council moved from the old offices in Oxford-street to its own building in Hallam-street, a change involving financial responsibility which fell largely on the Council's treasurer. Tomes also served as chairman of the Dental Committee. The knowledge gained from this work was of great value to the Dentists Act Committee appointed by the Privy Council to consider what changes, if any, were desirable in the Dentists Act of 1878, the report of which Committee led to the Dentists Act of 1921.

During the war Sir Charles Tomes served as chairman of the Norfolk and Norwich Hospital and inspected for the Norfolk Red Cross. After his retirement to Norfolk at the early age of 50 he continued his scientific studies until a heart attack two years ago limited his activities. He bore without complaining the loss of an eye through accident.

We are indebted to Sir Harry Baldwin for a very interesting series of personal recollections of his friend and partner, of which the following is an extract:—

My first sight of him, Sir Harry writes, as he walked into the theatre to give his 8 A.M. lecture at the Dental Hospital, remains sharply defined in my memory; the tall, athletic figure, the striking face, the head pushed forward, the beard hanging free. I was a young student then; he was 35. His lectures on his favourite subject—dental anatomy, human and comparative—were always fully attended and listened to with the greatest attention. Before coming to London as a dental student I had made some acquaintance with the literary works of both John and Charles Tomes and was impressed by their consummate literary style, and formed the conclusion early that the two men were the leading lights of the profession I was to follow. Imagine my delight when two years later the Dean informed me that Mr. Charles Tomes desired me to join him in practice. His practice was large and chiefly of a very distinguished class. For nine and a half months of the year he slaved from morning till night with a bare half-hour's interval for lunch, and often I returned after dinner to find him pursuing some problem of practical operative work, indulging his artistic abilities by enamelling some jewellery of his own making, or fashioning a silver plaque. His eye for form and colour and his love of art enabled him to paint and sketch exceedingly well, and on several occasions his works were hanging very near the line in the Royal Academy and other London exhibitions. In both oil and water-colour he was equally successful. His many-sided mind enabled him to practise good music and to read it at sight. He used to get much pleasure out of part-singing and sang regularly as a member of the Moray Minstrels. His other recreations included boat-sailing single-handed, fly-fishing, shooting, billiards, and whist. He was a great lover of animals; he often paid visits to the Gardens (he was vice-president of the Zoological Society), and at one time performed autopsies on all the animals whose bodies he could secure. He was on very good terms with many of these during life, particularly the less harmful snakes who loved to explore his pockets. He was devoted to his own dogs, particularly Irish Setters, of which he had some fine specimens. I remember him nursing almost continuously for several days and nights a favourite hound.

Charles Tomes not only possessed a brilliant intellect but his mind was absolutely just and honourable. He was rather shy and retiring, with no desire for self-advertisement and with a positive repulsion to anything savouring of sentimentality or affectation. Whenever he purposed to make any change which might affect the interests of his

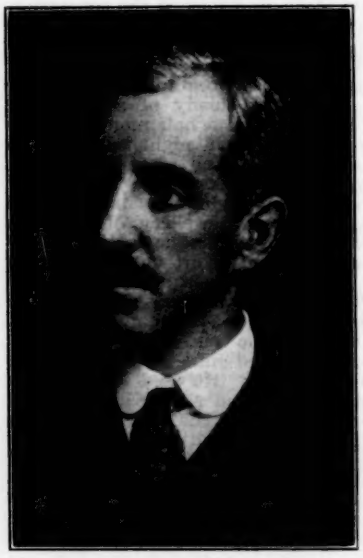
subordinates he would call them together and lay his plans before them prior to taking action. His breadth of vision, wisdom, and impartiality caused him often to be approached by fellow practitioners for help and guidance chiefly in settling difficulties with their colleagues, and his view of the case was, I believe, always ungrudgingly accepted as final. When questions arose concerning partnership or problems of an actuarial nature he never seemed obliged to refer to experts but simply and easily worked out the figures himself. It was this mathematical side of his intellect coupled with his breadth of judgment which was no doubt the reason for his appointment as treasurer to the General Medical Council soon after taking his seat in the Council Chamber.

His likeness to his father in mind and body was very remarkable. They had the same dignity of mind and character, the same powerful intellects and broad interests, the same devotion to science. Charles was taller and physically stronger than his father, but in later life the facial resemblance grew to be most striking. John began his work at a time when nothing had been done to build up and associate practitioners of dentistry into an organised and liberal profession. He had to forge his own position and that of his profession out of almost nothing, whereas Charles was born into a position carrying great prestige, received an exceptionally splendid education, and was backed by adequate funds. Father and son were a monumental pair. We shall never see their like again.

Sir Charles Tomes married in 1873 a daughter of Dr. Charles Cook, of Brooklyn, U.S.A., who survives him with a daughter.

LOUIS LAWRENCE CASSIDY, M.B. EDIN., F.R.C.S. IREL.

THE sudden death of Mr. Louis Cassidy last Saturday, as the result of a hunting accident, is deeply regretted throughout the profession in Dublin. He was 51 years of age, and was within a few weeks of completing his term of seven years as Master of the Coombe Hospital.



LOUIS LAWRENCE CASSIDY.

Louis Cassidy was born at Enniskillen, Co. Fermanagh, and in early life went to sea. After making his way to his master's certificate he abandoned the mercantile marine and began the study of medicine at the University of Edinburgh. Taking his medical degree in 1908 he came to Dublin as assistant to Prof. A. C. Geddes, who was at that time professor of anatomy in the school of the Royal College of Surgeons in Ireland. Cassidy proceeded to the Fellowship of the College in 1911, and decided to devote himself to the specialty of midwifery, being appointed Assistant Master of the Coombe Hospital. His work in Dublin was interrupted by the outbreak of the war. He joined the Royal Army Medical Corps and was posted to the Salonika Expedition, with which he spent some three years. On his return to Dublin he resumed work at his specialty, and in November, 1921, was elected Master of the Coombe Hospital. He also held the post of gynæcologist to the Royal City of Dublin Hospital, and had been for a time gynæcologist to Dr. Steevens' Hospital. He took an active part in the work of the Royal Academy of Medicine in Ireland, of which he was honorary secretary for foreign correspondence. He had also been for a term President of the Section of Obstetrics and Gynæcology.

Mr. Cassidy had studied much in continental clinics, chiefly at Vienna, and he did all he could to bring the Dublin School into touch with European progress. On his initiative a number of teachers from the continent gave courses of lectures in Dublin on several occasions. He worked hard to get endorsement for medical research in Ireland, and he was one of the principal movers in inaugurating the National Cancer Campaign (Ireland), to which he acted as honorary secretary. As Master of the Coombe he organised, in 1926, the Congress of Gynæcology, which marked the centenary celebrations of that hospital. Energetic in many movements for the advance of scientific medicine, Cassidy was content to work and move others to work without ever seeking publicity. In charitable causes he was as active as in scientific work, and few guessed the extent of his private generosity.

Of his service in Egypt and Macedonia during the war, Dr. W. G. Willoughby writes as follows: "Although a distinguished gynæcologist he with characteristic versatility became an enthusiastic sanitary officer in Macedonia, and did excellent work in the prevention of malaria. I have a photograph showing him with his Turkish labour detachment clearing a mosquito-infested stream. In helmet, shirt, and shorts, in a shade temperature of over 100° F., I found him as usual cheery and keen and regarded with affection by his men whether British or Balkans. The staff of the 31st Casualty Clearing Station at Janes will never forget his abilities as mess secretary of the C.C.S., especially in 'foraging.' In Mr. Cassidy we have lost not only a clever man but a charming companion and one of the most popular officers of the Twelfth Army Corps in Macedonia."

Mr. Cassidy leaves a widow with a son and daughter.

DUCHESS OF YORK MATERNITY CENTRE.—This centre was opened some three years ago in premises at 434, Essex-road, N., and it has become so popular with the mothers of the district that additional accommodation has been found necessary. On Oct. 29th a meeting was held at the centre, under the chairmanship of Lord Riddell, when an extension to the premises was declared open by Lady Lovat. A medical officer, a dispenser-chauffeuse, a nurse, and three students live at the centre; the patients attend for antenatal care, and their confinements are conducted in their own homes by the students, the doctor and nurse paying as many visits as are considered desirable. At the opening ceremony Miss Gertrude Tuckwell and Prof. A. Louise McIlroy spoke. The former alluded to the unanimity expressed by practitioners as to the importance of antenatal supervision in the task of reducing maternal mortality and morbidity, and said that a series of clinics similar to this centre, spread over the country, would be a factor in preserving maternal life and health. Prof. McIlroy explained that the clinic, which was run in connexion with the Royal Free Hospital, was entirely devoted to maternal and gynæcological work, and not in any way connected with treatment of venereal disease. The women were encouraged to come as early in their pregnancy as possible, and were thoroughly overhauled. If any treatment was found to be necessary they were referred to their own doctor, or to the nearest treatment clinic, or sent to the Royal Free Hospital. A dental clinic had been established, and no less than 75 per cent. of the women attended it. Every patient was seen about a fortnight after delivery, and was advised to take her baby to one of the welfare centres in Islington; she was given a card with the history of her case to show the medical officer. An evening clinic was held at the centre for girls suffering from gynæcological conditions whose work made it difficult for them to attend hospital in the daytime. At this clinic any of the mothers requiring attention after confinement were also treated. There had been no maternal death among more than 500 patients cared for last year.

Medical News.

UNIVERSITY OF CAMBRIDGE.—At a congregation on Oct. 27th the following degrees were conferred:—

M.D.—H. F. Brewer and Harold Wacher.

M.B., B.Chir.—R. M Gilchrist, W. R. Ashby, and J. W. Monro.

The *Pinsent-Darwin Studentship in Mental Pathology* was founded in 1924 by the benefaction of Mrs. Pinsent and Sir Horace and Lady Darwin for the purpose of promoting research into any problem which may have a bearing on mental defects, diseases, or disorders. It is of the annual value of about £200 and is tenable for three years in the first instance. The student may be of either sex and need not be a member of the University of Cambridge. He shall engage in original research in Cambridge or elsewhere but may, subject to the consent of the managers, carry on educational or other work concurrently. Further particulars of the studentship may be obtained from the Registrary of the University of Cambridge, and applications for appointment to the studentship should be made in proper form before Dec. 1st, 1928.

UNIVERSITY OF LONDON.—At a meeting of the Senate held on Oct. 24th Mr. Geoffrey Duveen's offer to make a further donation for the Travelling Studentship in Oto-Rhino-Laryngology was accepted with thanks, and regulations for the award of the studentship were adopted.

The Laura de Saliceto Studentship, of the value of £150, was awarded for 1929 to Mr. A. F. Watson, Ph.D., for the purpose of continuing investigations on a detailed study of dietary and other factors contributing to the genesis and development of experimentally induced tumours in animals.

University College Hospital.—Three lectures, illustrated by lantern slides, will be given by Dr. Charles Singer at University College Hospital Medical School, Gower-street, on Mondays, Nov. 12th, 19th, and 26th, at 4.15 P.M. The subjects will be diphtheria, small-pox, and plague respectively. The lectures will be open to all medical students of the University.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—An ordinary meeting of the College was held on Oct. 25th, with the President, Sir John Rose Bradford, in the chair.

Dr. William Willis Dalziel Thomson was admitted to the Fellowship in absentia.

The following were elected Members:—

Mahomed Abdul Hamid, Samuel Berman, Bir Bhan Bhatia, Harold Livingstone Coulthard, William Hofmeyr Craib, Richard Desmond Curran, Wilfred Evans, Thomas Norman Fisher, Wilfred Fletcher Gaisford, Hugh Walker Gordon, Bruce Atlee Hunt, Samuel Levy Simpson, John Kirkpatrick Monro, Oswald Ellis Joseph Murphy, Frank Bett Parsons, Alan Meredith Richards, Thomas Frederick McNair Scott, Frederick Horace Smirk, Allan William Spence, Bernard Clive Tate, William Rayner Thrower, and Harold Frederick Wilson.

Licences to practise were conferred upon 159 candidates (including 19 women) who have passed the Final Examination in Medicine, Surgery, and Midwifery of the Conjoint Board, and have complied with the by-laws of the College. The following are the names and medical schools of the successful candidates:—

A. G. Adrian, Cape and St. Mary's; W. H. Allan, Guy's; V. E. N. Allen, Bristol; T. C. Baker, Cape and St. Mary's; G. N. Beeston, Charing Cross; W. A. Bellamy, St. Bart.'s; George Bellman, St. George's; W. L. M. Bigby and J. B. Blaikley, Guy's; C. V. Bloom, London; K. C. Blyth, Sheffield and London; B. J. Bouché, Madras and Guy's; M. T. Brockman, J. D. Cambrook, and F. E. Camps, Guy's; Mohammed Sobhi Chafey, Cairo and Charing Cross; Benjamin Cimbelmann, Basle and Middlesex; H. A. Clarke, Guy's; A. M. Clarkson, Univ. Coll.; L. I. Cohen, London; S. M. Cohen, Cape and Guy's; Elizabeth Cooper, Royal Free; R. A. S. Cory, Bristol; W. W. Craner, London; T. V. L. Crichlow, King's College; H. W. D. Crook, Guy's; S. H. Croot, Cambridge and Guy's; T. M. Davie, Oxford and Middlesex; Evelyn M. Davies and H. S. Davies, King's College; C. C. Davis, Univ. Coll.; D. C. L. Derry, St. Thomas's; P. C. C. De Silva, King's College; J. S. Dinsdale, Leeds; Marjorie M. Dobson, Royal Free; Archibald Dodd, Liverpool; F. T. Doleman, St. Mary's; R. M. Dowdeswell, Cambridge and St. Thomas's; Richard Doyle, Liverpool; E. C. Duffett, Cambridge and Guy's; J. T. Dunkerley, Cambridge and St. Bart.'s; F. W. Earle, Liverpool; E. L. Edmondson, Cambridge and London; Dorothy E. Eglington, Royal Free; H. F. Ellis, Liverpool; Mahmoud Mohamed El Toubi, Cairo and Sheffield; C. N. Evans, St. Bart.'s; Geraldine W. Everett, Royal Free; J. S. S. Fairley, Cambridge and Birmingham; W. B. Fiddian-Green, Cape, Oxford, and St. Mary's; R. L. Flett, Otago; H. T. Flint, Westminster; Agnes B. Francklyn, Royal Free and St. Mary's; G. H. V. Froggatt, Sheffield; Maximo Gamboa, Costa Rica and St. Bart.'s; J. H. P. Games, Univ. Coll.; Ishak Kirolos Gayid, Cairo; W. N. O. George, Cardiff and Univ. Coll.; Reginald Glanvill, Guy's; F. W. H. Grenier, Cambridge and London; Valentina Pavlovna Guercken, Westminster; H. W. Guinness, St. Bart.'s; F. R. Gusterson, St. Thomas's; Linnie A. Hamar, Charing Cross; W. F. L. Hannay, Guy's; W. G. Harvey, St. Mary's; C. K. Haskard, Adelaide and London; W. E. Herbert, Guy's; H. P. Himsworth, Univ. Coll.; Benjamin Hoffenberg, Cape and Liverpool; J. H. Hopper, Cambridge and St. Thomas's; Stanford Howard, Oxford and London; C. F. Howes, St. Thomas's; Maurice Hurwitz, Leeds; Esmé I. Hyam, Univ. Coll.; John Ives, St. Mary's; L. A. Joelson, Cape and London; C. H. Johnson, Guy's; D. T. Jones, Cardiff and Guy's; G. R. Jones, Cambridge and King's College; J. G. Jones, Cambridge and Univ. Coll.; Hassenjee Joomye, Middlesex; P. G. S. Kennedy, Cambridge and London; Esther M. Killick, Leeds; Simon Kin, King's College; R. W. Knowlton, Cambridge and Middlesex; T. C. Kohler, Adelaide and London; Marie Krestin, Charing Cross; Lekhraj Rochiram Lalwani, Bombay and London; A. L. Light, Leeds; T. K. S. Lyle, Cambridge and King's College; R. G. Macbeth, Oxford and King's College; A. L. McFarlane, King's College; C. M. MacGeoch, Birmingham; W. Mc.O. MacGregor, Cambridge and London; Kundan Lall Malhautra, Punjab and Univ. Coll.; C. E. Martin, Birmingham; E. R. R. Mellon, Guy's; W. T. Mills, St. Bart.'s; Joseph Mindline, Westminster; A. D. Morton, Cambridge and St. Thomas's; L. H. Mottet, Univ. Coll.; E. C. Murphy and J. R. Murray, London; Edith G. Niven and Eric Ogden, Univ. Coll.; C. R. L'E. Orme, Cambridge and King's College; C. G. Palne, St. Mary's; V. E. Palmer, Cambridge and St. Thomas's; Keren I. Parkes, King's College; G. F. D. Perrott, Birmingham and St. Bart.'s; E. R. S. Phillips, Oxford and London; G. W. Pickering, Cambridge and St. Thomas's; P. H. L. Playfair, Cambridge and King's College; T. R. Plummer, Oxford and St. George's; E. E. Prebble, Liverpool; Norman Pyecroft, Leeds; Henry Richards, Guy's; H. G. G. Robertson, St. Thomas's; R. D. Robinson, St. Bart.'s; R. S. Robinson, Middlesex; Margaret C. Rosser and H. W. Round, Birmingham; E. L. Rubin, Liverpool; D. J. Sagor, Cape and London; G. H. Sanderson, Cambridge and Univ. Coll.; Raghunandan Vinayak Sanzgiri, Bombay and London; J. E. Schneider, St. Thomas's; S. A. Scorer, Guy's; Elizabeth H. Scurfield, Royal Free; Mary C. Seward, Cambridge and Univ. Coll.; R. R. Shapland, Middlesex; Samuel Shone, Guy's; Maurice Silverstone, Liverpool; J. E. Snow, St. Bart.'s; Ernest Somasekhar, Madras and Birmingham; Vencatachari Srinivasan, Madras and Middlesex; Barry Stewart, Cambridge and Leeds; J. O. Terry, Leeds; P. R. Thambugala, Calcutta and Middlesex; A. R. Thomas, Cambridge and St. George's; C. P. K. Toland, Cambridge and Westminster; E. A. Utting, St. Mary's; H. D. Vasey, St. Thomas's; R. G. L. Waller, Westminster; David Wardrop, Birmingham and St. Mary's; Jack Wasserzweig, Cape and London; Olive C. Watkin, Charing Cross; C. E. W. Wheaton, St. Thomas's; A. T. D. Whitfield, Birmingham; L. V. Williams, Cardiff and St. Bart.'s; L. K. Wills, Cambridge and Guy's; Alan Wilson, Leeds; John Winter, Middlesex; F. W. J. Wood, Cambridge and St. Bart.'s; Margaret D. Wright, Univ. Coll.; J. M. Wrigley, Sheffield and London; Nubar Yacoubian, Birmingham; and H. S. T. Young, Cambridge and St. Thomas's.

The Streatfeild Research Scholarship was awarded to Dr. R. A. Hickling, and the Jenks Memorial Scholarship to Hugh Donald Fleming, late of Epsom College.—The appointment of Dr. J. A. Glover to the Milroy Lectureship for 1930 was announced, and Mr. W. A. Greene, K.C., was elected Senior Standing Counsel to the College.—The following were elected as Councillors: Dr. C. R. Box, Dr. J. H. Thursfield, Dr. Charles Bolton, Sir Charlton Briscoe, and Dr. J. A. Arkwright.—Sir Francis Champneys was re-elected to represent the College on the Central Midwives Board.—Dr. Raymond Crawfurd was re-elected a member of the committee of management.

SOCIETY OF APOTHECARIES OF LONDON.—At recent examinations the following candidates passed in the undermentioned subjects:—

Surgery.—G. N. Beeston, Charing Cross Hosp.; J. M. Connor, St. Mary's Hosp.; L. P. Gregory, Bristol; H. H. Jackson, Charing Cross Hosp.; E. P. Johnson, Manchester; A. A. Leibovitch, Kharkoff and London Hosp.; K. R. Lundeberg, Minnesota, U.S.A.; and D. F. Michael, St. Mary's Hosp.

Medicine.—A. R. D'Abreu, Leeds; E. A. Johnstone, Manchester and Charing Cross Hosp.; T. K. S. Lyle, King's College Hosp.; C. P. Madden, St. Bart.'s Hosp.; A. F. Quarmby, Birmingham; and A. E. Vawser, London Hosp.

Forensic Medicine.—G. E. Bent, Manchester; J. M. Connor, St. Mary's Hosp.; A. R. D'Abreu, Leeds; A. E. Gibbs, London Hosp.; E. A. Johnstone, Manchester and Charing Cross Hosp.; T. K. S. Lyle, King's College Hosp.; M. H. Rashwan, Guy's Hosp.; and R. W. Scanlon, St. Thomas's Hosp.

Midwifery.—J. M. Connor, St. Mary's Hosp.; N. Das, London Hosp.; W. S. Ghai, Charing Cross Hosp.; M. Hurwitz, Leeds; E. A. Lipkin, Liverpool and Charing Cross Hosp.; E. O'C. Parsons, Sheffield and St. Bart.'s Hosp.; A. F. Quarmby, Birmingham; R. W. Scanlon, St. Thomas's Hosp.; and A. W. B. Wiggins, Sheffield.

The Diploma of the Society was granted to the following candidates, entitling them to practise medicine, surgery, and midwifery: A. R. D'Abreu, A. E. Gibbs, M. Hurwitz, H. H. Jackson, A. A. Leibovitch, C. P. Madden, A. F. Quarmby, and A. E. Vawser.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—At the Dental Examinations just concluded the following were the successful candidates:—

FIRST DENTAL PROFESSIONAL EXAMINATION.

Charles Purves Moore.

Biology.—Christine Evelyn Rose and Eric Thomas Jardine Dykes.

FINAL PROFESSIONAL EXAMINATION.

L.D.S. R.C.S. Edin.—Dorothy Williams, John Watson Gregory, Terence George Ward, Hamish Gordon Somerville, William James Rankine, Agnes Ferguson Miller, Peter Jackson Veitch Robertson, Duncan Gould, Owen Hartley Wicksteed, Francis Kerr Fenton, Eric Howarth Watson, William Russell Logan, Robert Allan Wilson McKendrick, and Fathi Soliman Abaza.

Pathology.—Donald McLeod Stuart.

Medicine.—George Gordon Brown and William Paterson Shand.

Surgery.—George Gordon Brown and William Paterson Shand.

Dental Subjects.—Joseph Gordon Medcalf and Mark Lessnoff.

UNIVERSITY OF MANCHESTER.—Dr. E. W. Twining has been appointed lecturer in radiology.

UNIVERSITY OF LEEDS.—The annual dinner of past and present students of the School of Medicine, Leeds, will take place on Nov. 9th at the Hotel Metropole, Leeds, under the presidency of Dr. C. W. Vining.

ROYAL INSTITUTE OF PUBLIC HEALTH.—The next annual congress of this Institute will be held in Zurich during Whitsuntide, 1929, the dates being May 15th–20th.

BRITISH INSTITUTE OF RADIOLOGY AND RONTGEN SOCIETY.—The annual dinner of the British Institute of Radiology incorporated with the Rontgen Society, will be held at the Trocadero Restaurant, Piccadilly-circus, London, on Friday, Nov. 16th, at 7.30 for 7.45 P.M. The President, Mr. G. W. C. Kaye, D.Sc., will take the chair.

BRITISH COMMITTEE ON RHEUMATISM.—A meeting to consider the reorganisation of this committee on a wider and more independent basis will be held at the house of the Royal Society of Medicine, 1, Wimpole-street, London, W., on Wednesday, Nov. 7th, at 5 P.M. Any member of the medical profession interested in this proposal is invited to attend.

GLASGOW UNIVERSITY CLUB, LONDON.—The annual autumn dinner of this club is to be held at the Trocadero Restaurant, Piccadilly-circus, on Friday, Nov. 23rd, at 7.15 for 7.30 P.M., when Mr. James Bonar, LL.D., will preside. Any Glasgow University men who, though not members of the club, would like to attend are requested to communicate with the Hon. Secretaries at 62, Harley House, N.W. 1.

POST-GRADUATE COURSE ON DISEASES OF THE CHEST.—The Joint Tuberculosis Council has arranged a course of post-graduate lectures and demonstrations on the Pathology of Tuberculosis and Allied Chest Diseases, to be given at the City of London Hospital, Victoria Park, E., from Nov. 26th to Dec. 1st. The lecturers will be Dr. S. Roodhouse Gloyne, Dr. W. Burton Wood, Dr. F. G. Chandler, Dr. Clive Riviere, Mr. R. H. O. B. Robinson, Dr. H. V. Morlock, and Dr. J. V. Sparks, and the wards and special departments of the hospital will be open to members of the course. Further information may be had from Dr. William Brand, hon. secretary of the Council, at The Larches, Farnham Royal, Bucks.

DONATIONS AND BEQUESTS.—By the will of the late Dr. J. J. Perkins, St. Thomas's Hospital Medical School will receive £1000 for research work.—The late Alderman James G. Lowe, J.P., of Stalybridge, Cheshire, left by will £1000 to the District Infirmary, Ashton-under-Lyne, for the Endowment Fund.—The Orthopædic Hospital and Home for Crippled Children, Bristol, will benefit by the sum of £500; and the Royal Infirmary, Bristol, the General Hospital, Bristol, and the Bristol Eye Hospital by £250 each, under the will of the late Mr. F. C. Niblett, of Clifton, Bristol.—The late Miss Alice Temple, of Kingston-on-Hull left among other bequests £500 to the Hull Royal Infirmary and £250 each to the Hull Blind Institution, the Hull and Sulcoates Dispensary, and the Victoria Children's Hospital, Hull.—The Middlesex Hospital has received from Mr. G. Vaughan Morgan a further donation of £5000 for the rebuilding fund.—St. Mary's Hospitals, Manchester, have received the following legacies: Executors of the late Sir Edward Holt, £1000; executors of the late Henry Franc, £500.—The King has forwarded £728 to the Queen's Institute of District Nursing, the proceeds of the opening of the Sandringham Gardens to the public during the season.—Mr. Charles Curd, M.R.C.S., of Bath, left £250 each to the Royal United Hospital, Bath, and the Monmouth-street Society, Bath.

NEW TREASURER OF RADCLIFFE INFIRMARY.—Mr. W. W. Goodenough, of Broadwell Manor, Lechlade, has been elected honorary treasurer of the Radcliffe Infirmary, Oxford, in succession to the Rev. G. B. Cronshaw.

ST. THOMAS'S HOSPITAL DINNER.—Mr. E. F. White took the chair at the annual dinner at St. Thomas's House on Oct. 26th. He had found records, he said, of an anniversary dinner held as long ago as 1822, and he felt sure that the custom had been going on for more than 100 years. He himself had entered the hospital in 1876 when there were many remnants of the old Surrey-gardens tradition, of which he gave some entertaining reminiscences. As an old captain of cricket and football he hoped to see St. Thomas's House filled with cups, and he would like to know where were the records of the past 50 years. When the present generation could do better than his own generation he would take off his hat to them. Mr. G. Q. Roberts referred to the scheme for transferring the medical school to the other side of the road and building an extension of the hospital where the school now stands. He also spoke of the appointment of Dr. R. J. C. Thompson to succeed Dr. L. B. Maxwell as medical secretary. Prof. L. S. Dudgeon, as Dean, said that he doubted whether the medical school had ever been in a more flourishing condition. This was especially due to the skill, enthusiasm, and devotion of Sir Cuthbert Wallace over a period of ten years, and he thought that no man had ever done more for the welfare of the hospital. After referring to the losses sustained during the past year, with special mention, among others, of Sir Bryan Donkin, Dr. Chisholm Williams, and Dr. J. J. Perkins, Prof. Dudgeon went on to speak of the knighthood conferred on Mr. Percy Sargent and of recent changes in the staff. Dr. S. J. Cowell had been elected to the new chair in dietetics; Dr. W. H. B. Stoddart was retiring to a leisure in which he would be able to think still higher thoughts; and the place of Dr. Thomas Carnwath as lecturer in public health had been taken by Dr. C. T. Maitland. A post-graduate course had been held in September and had proved a colossal success. Next year it might be held at the time of the annual dinner. After recounting the athletic honours of the year—including the winning of the golf, tennis, second XI. hockey, and the boxing for the third year in succession—and the academic distinctions, Prof. Dudgeon concluded by proposing the health of the chairman. Besides being anæsthetist to the hospital, Mr. White, he said, had been a great athlete, an international Rugby footballer—which very few anæsthetists to the hospital now were—and had taken an important part in founding the new St. Thomas's House.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY, Albemarle-street, W.

THURSDAY, Nov. 8th.—4.30 P.M. *The following papers will be read:* S. B. Schryver, F.R.S., and E. J. Candlin: Investigations on the Cell Wall Substances of Plants, &c. S. Dickinson: Experiments on the Physiology and Genetics of the Smut Fungi. (Communicated by V. H. Blackman, F.R.S.) Isabella Gordon: Some Further Studies in the Development of the Skeleton in Echinoderms. (Communicated by E. W. MacBride, F.R.S.) R. R. Gates and F. M. L. Sheffield: Chromosome Linkage in certain Œnothera Hybrids. (Communicated by Sir John Farmer, F.R.S.) *The following papers will be read in title only:* Ruth Deanesly: A Study of the Adrenal Cortex in the Mouse and its Relation to the Gonads. (Communicated by J. P. Hill, F.R.S.) W. J. Dakin: Anatomy and Phylogeny of Spondylus, with a particular reference to the Lamellibranch Nervous System. (Communicated by E. W. MacBride, F.R.S.) W. J. Dakin: The Eyes of Pecten, Spondylus, Amussium and Allied Lamellibranchs with a short discussion on their Evolution. (Communicated by E. W. MacBride, F.R.S.) C. E. Walker: Artefacts as a Guide to the Chemistry of the Cell. (Communicated by Sir John Farmer, F.R.S.) F. F. Blackman, F.R.S., and P. Parija: Analytic Studies in Plant Respiration (1). P. Parija: Analytic Studies in Plant Respiration (2). The Respiration of Apples in Nitrogen and its Relation to Respiration in Air. (Communicated by F. F. Blackman, F.R.S.) F. F. Blackman, F.R.S.: Analytic Studies in Plant Respiration (3). Formulation of a Catalytic System for the Respiration of Apples and its Relation to Oxygen.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, Nov. 5th.—8.30 P.M., DISEASE IN CHILDREN. A Discussion will be held on Fibrosis of Lung. Openers: Dr. L. S. T. Burrell, Mr. Tudor Edwards.

TUESDAY.—5.30 P.M., ORTHOPÆDICS. (Cases at 4.30). 8.30 P.M., PATHOLOGY. Laboratory Meeting at University College Hospital Medical School.

WEDNESDAY.—5 P.M., HISTORY OF MEDICINE. The following papers will be read:—Dr. Philip Gosse: Pirate Surgeons. Mr. Percy Flemming: The Medical Aspect of the Mediæval Monastery. Dr. Charles Singer: The Medical Manuscripts of Sir William Petty. 8.30 P.M., SURGERY. Presidential Address: Sir Holburt Waring: Surgical Education and Surgical Practice in the Future.

THURSDAY.—5 P.M., BALNEOLOGY. Presidential Address by Dr. G. L. Kerr Pringle. 8 P.M., NEUROLOGY. Clinical Meeting, West End Hospital for Diseases of the Nervous System, Out-patient Department, Welbeck-street, W.

FRIDAY.—5.30 P.M., CLINICAL. (Cases at 5 P.M.) Cases will be shown by Dr. C. F. T. East: (1) Case of pulsating liver. Dr. J. G. Y. Bell: (2) Case of sacro-coccygeal tumour. Mr. H. C. Edwards: (3) Case of syphilitic disease of the radius. Mr. C. P. G. Wakeley: (4) Case of recurrent dislocation of the hip, and (5) Case of clicking hip. Dr. C. Worster-Drought: (6) Case of acromegaly. Other cases will be shown. 8 P.M., OPHTHALMOLOGY. Cases will be shown. Papers: Mr. A. H. Levy: Injury of Lens Causing Alteration of Refraction. Mr. A. F. MacCallan: Ocular Manifestations of Local Sepsis.

HUNTERIAN SOCIETY.

MONDAY, Nov. 5th.—9 P.M. (in The Cutlers' Hall, Warwick-lane, E.C.). Discussion on The Doctor on the Stage. Dame Madge Kendall, Sir StClair Thomson, Lady Simson (Miss Lena Ashwell), Dr. Harold Dearden, and Mr. Ivor Back have promised to take part in the discussion.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.

TUESDAY, Nov. 6th.—5 P.M., Dr. G. F. Still: History of Pædiatrics to the end of the Sixteenth Century. (First FitzPatrick Lecture.)

THURSDAY.—5 P.M. (Concluding FitzPatrick Lecture.)

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields, W.C.

MONDAY, Nov. 5th.—5 P.M., Mr. T. W. P. Lawrence: Demonstrations of Surgical Specimens.

THURSDAY.—5 P.M., Mr. C. H. Fagge: Axial Rotation, Purposeful and Pathological. (Bradshaw Lecture.)

UNIVERSITY COLLEGE, Gower-street, W.C.

MONDAY, Nov. 5th.—5 P.M., Prof. E. B. Verney: Urinary Secretion. (Fourth lecture.)

FRIDAY.—5 P.M., Prof. J. C. Drummond: Recent Work on Vitamins. (Fifth lecture.) 5.30 P.M., Dr. J. Owens, A.M.I.C.E.: Smoke Pollution of the Air and Public Health. (Second public lecture.)

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, Nov. 5th.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Surgical Wards. 2 P.M., Mr. Simmonds: Surgical Out-patients.

TUESDAY.—11 A.M., Mr. Endean: Venereal Diseases (demonstration). 2 P.M., Dr. Shaw: Medical Out-patients. 2 P.M., Mr. Hamblen Thomas: Throat, Nose and Ear Department.

WEDNESDAY.—10 A.M., Dr. Burnford: Medical Wards. 2 P.M., Mr. Tyrrell Gray: Operations. 2.30 P.M., Mr. Donald Armour: Surgical Wards. 4.30 P.M., Dr. Trevor Davies: Gynæcological Diagnosis.

THURSDAY, Nov. 1st.—10 A.M., Dr. Grainger Stewart: Neurological Department. 2 P.M., Dr. Ironside: Medical Out-patients. 2 P.M., Mr. Bishop Harman: Eye Department.

FRIDAY.—10 A.M., Dr. Pritchard: Medical Wards. 2 P.M., Mr. Sinclair: Surgical Out-patients. 2 P.M., Mr. Vlasto: Throat, Nose and Ear Department.

SATURDAY.—9 A.M., Mr. Vlasto: Operation on Throat, Nose and Ear. 9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Medical Diseases of Children.

Daily, 10 A.M. to 5 P.M., Saturdays 10 A.M. to 12 noon. Medical and Surgical In-patients and Out-patients. Operations, Special Departments, Anæsthetic Course.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, Nov. 5th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Throat, Nose and Ear Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin and Eye Clinics. Operations.

THURSDAY, Nov. 1st.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Ear, Nose and Ear, Nose and Throat Clinics. Operations.

FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Nov. 5th, to SATURDAY, Nov. 10th.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. Lecture by Mr. Aleck Bourne: When is the Retroverted Uterus a cause of Symptoms? on Mon. at 5 P.M. CHARING CROSS HOSPITAL, W.C. Clinical Demonstration in Gynæcology by Dr. Everard Williams at 2 P.M on Wed. PRINCE OF WALES'S HOSPITAL, Tottenham, N. Clinical Demonstration in General Surgery by Mr. E. Gillespie at 3 P.M. on Fri. WELLCOME MUSEUM OF MEDICAL SCIENCE, 33, Gordon-street, W.C. Wed. at 4 P.M., Demonstration by Dr. G. Carmichael Low on Recent work on Blood Diseases. The above are free. HAMPSTEAD GENERAL HOSPITAL, Haverstock Hill, N.W. Practitioners' Course. Second week, lectures and demonstrations in medicine, surgery and special departments, 4.30 to 6 P.M. daily. LONDON LOCK HOSPITAL, Dean street, W. Course of Clinical Demonstrations in Venereal Disease, every afternoon for four weeks.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

THURSDAY, Nov. 8th.—4 P.M., Mr. Twistington Higgins: Acute Appendicitis.

CENTRAL LONDON THROAT NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.

FRIDAY, Nov. 9th.—4 P.M., Mr. J. D. McLaggan: Otosclerosis.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, Nov. 6th.—5 P.M., Dr. H. W. Barber: Immunity and Anaphylaxis.

THURSDAY.—5 P.M., Dr. W. J. O'Donovan: Occupational Dermatitis.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

TUESDAY, Nov. 6th.—3.15 P.M. (at the Royal Chest Hospital) Dr. A. W. Stott: Demonstration of Cases in the Wards.

ST. PAUL'S HOSPITAL POST-GRADUATE COURSE, Endell-street, W.C.

THURSDAY, Nov. 8th.—4.30 P.M., Mr. W. K. Irwin: The Diagnosis and Treatment of Some Important Bladder Conditions.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.

WEDNESDAY, Nov. 7th.—4 P.M., Dr. T. F. Cotton: Diseases of the Heart and Blood-vessels in Relation to Industrial Occupations.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

TUESDAY, Nov. 6th.—4.15 P.M., Mr. C. Roberts: Early Symptoms of Cholecystitis.

FRIDAY, Nov. 9th.—4.15 P.M., Prof. R. B. Wild: The Treatment of Patients with Inoperable Cancer.

ANCOATS HOSPITAL POST-GRADUATE LECTURES, Mill-street, Manchester.

THURSDAY, Nov. 8th.—3.45 P.M., Dr. Renshaw: Recent Advances in Medical and Surgical Antiseptics.

Appointments.

BURNET, M., M.D., C.M. Edin., has been appointed a Medical Referee under the Workmen's Compensation Act for the Central District, Sheriffdom of Perth.

CLAY, JOHN, M.B. Durh., F.R.C.S. Eng., Lecturer in Surgery in the University of Durham.

GAUNT, MARIA L., M.B., Ch.B. Leeds, Assistant Medical Officer, Leeds Maternity and Child Welfare Centre.

JONES, E. CATHERINE MORRIS, M.B., B.S. Durh., B.Hy., D.P.H., Maternity and Child Welfare Medical Officer, Gloucestershire County Council.

MARSHALL, J. L., M.B., Ch.B. Dub., Medical Officer of Markethill Dispensary District, Armagh.

MORTON, JANET M., M.B., Ch.B. Edin., D.P.H., Assistant Medical Officer, Greenwich.

PRICHARD, A. A., M.D., B.Ch. Camb., Honorary Assistant Surgeon to the Ear, Nose and Throat Department, Cardiff Royal Infirmary.

TWINING, E. W., L.R.C.P., Lond., M.R.C.S., D.M.R.E. Camb., Lecturer in Radiology in the University of Manchester.

Certifying Surgeons under the Factory and Workshop Acts: ATKINSON, J. A., M.B., B.S. Lond. (Newnham, Gloucester); THOMAS, B., M.B., B.S. Lond. (Hirwain, Glamorgan); and WEATHERHEAD, A. G. N., M.B., Ch.B. Edin. (Stretford, Lancashire).

Vacancies.

For further information refer to the advertisement columns.

Aylesford, Kent, British Legion Village, Preston Hall.—Res. H.P. £100.

Birmingham City.—M.O. for Maternity and Child Welfare. £600.

Birmingham, City Babies Hospital.—Res. M.O. At rate of £150.
Birmingham City Hospital, Little Bromwich.—Third Asst. M.O. £350.
Birmingham, Midland Ear and Throat Hospital.—Asst. Surg. O. Also Second H.S. £200 and £150 respectively.
Cardiff, Prince of Wales' Hospital.—H.S. £120.
Delhi, Indian Red Cross Society.—Organising Secretary. Rs.1200 to Rs.1500 per mensem.
Dreadnought Hospital, Greenwich.—Med. Supt. £300.
Dumfries, Crighton Royal Mental Hospital.—Clinical Pathologist. £400.
East London Hospital for Children, &c., Shadwell, E.—Asst. Surg.
Exeter City.—Asst. M.O.H., &c. £600.
Exeter, Wonford House.—Jun. Asst. M.O. £300.
Frimley, Hospital for Consumption Sanatorium.—Sen. and Jun. H.P.'s. At rate of £150 and £100 respectively.
Golden-square Throat, Nose and Ear Hospital, W.—H.S. £100.
Halifax County Borough.—M.O.H. £1000.
Harefield, Middlesex, County Sanatorium.—Third Asst. Res. M.O. £400.
Islington Dispensary, 303, Upper-street, N.—Asst. Res. M.O. £220.
King's College Hospital, Denmark Hill, S.E.—Sister-Matron.
Lahore, King Edward Medical College.—Professor of Pathology. Rs.1200–50—2100 per mensem.
Leamington Spa, Warneford General.—H.P. and H.S. Each £165.
L.C.C. Mental Hospitals Service.—Eighth Asst. M.O. £300.
London Jewish Hospital, Stepney Green, E.—Hon. Asst. Phys.
Manchester Royal Infirmary.—Res. Clin. Pathologist. £100.
Norwich, Norfolk and Norwich Hospital.—H.S. to Ear, Nose, and Throat Department. £120. Also H.S. £120.
Nottingham, General Hospital.—H.S. At rate of £150.
Nottinghamshire County Council.—Tuberculosis Officer. £750.
Portsmouth, Royal Portsmouth Hospital.—Sen. H.S. At rate of £200.
Princess Louise Kensington Hospital for Children, N. Kensington. Hon. Asst. S. to Nose, Throat and Ear Dept.
Queen's Hospital for Children, Hackney-road, E.—H.P., H.S., and Cas. O. Each at rate of £100.
Reading, Royal Berkshire Hospital.—Pathologist, &c. £750. Also Third H.S. and Res. Anæsthetist. At rate of £150.
St. Mary's Hospital for Women, &c., Plaistow, E.—Hon. Asst. P.
St. Peter's (Whitechapel) Hospital, 74, Vallance-road, E.—Res. Asst. M.O. At rate of £450.
West Bromwich, Hallam Hospital.—Res. H.S. £250.
West London Hospital, Hammersmith-road, W.—H.P., H.S. Also Aural and Ophth H.S. Each at rate of £100.
Windsor, King Edward VII. Hospital.—Sen. H.S. Also Jun. H.S. At rate of £120 and £100 respectively.
Worcester General Infirmary.—Jun. Res. M.O. £120.
Worcestershire County Council.—Asst. County M.O. £600.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Prescot (Lancashire), and Huntly (Aberdeenshire).

Births, Marriages, and Deaths.

BIRTHS.

COLE.—On Oct. 26th, at 3, Wilbraham-place, S.W., the wife of Leslie Cole, M.D., M.R.C.P., of Trumpington-street, Cambridge, of a son.

HART.—On Oct. 22nd, at Platt's-lane, N.W., the wife of S. L. Hart., L.D.S., of a daughter.

HORNIBROOK.—On Oct. 25th, at Ethorpe House, Gerrard's Cross, the wife of H. Nevill Hornibrook, M.B., B.S. Lond., of a son.

MATHER.—On Oct. 23rd, at Lindfield, Hayward's Heath, the wife of Dr. F. H. Mather, of a son.

DEATHS.

ABRAM.—On Oct. 24th, at Reading, Sir George Stewart Abram, J.P., M.B. Camb., in his 63rd year.

HARTLEY.—On Oct. 21st, at Royal-avenue, Scarborough, Reginald Hartley, M.D., F.R.C.S., in his 76th year.

KNIGHT.—On Oct. 25th, at Mecklenburgh-square, W.C., Edward Knight, M.R.C.S., late of Cook's School, in his 69th year.

TOMES.—On Oct. 24th, at Mannington Hall, Aylsham, Sir Charles Sissmore Tomes, M.A., LL.D., F.R.S., F.R.C.S., in his 83rd year.

WARREN.—On Oct. 23rd, at Frith Cottage, East Farleigh, Kent, John Grant Warren, L.R.C.P. & S., D.P.H.

WETHERED.—On Oct. 28th, at his residence, Falmouth, Frank Joseph Wethered, M.D., F.R.C.P., in his 69th year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

THE LANCET: SUBSCRIPTION RATES.

INLAND	One Year	£2	2	0
	Six Months	1	1	0
	Three Months	0	10	6
ABROAD	One Year	2	10	0
	Six Months	1	5	0
	Three Months	0	12	6

Notes, Comments, and Abstracts.

ALCOHOL AND DRUG ADDICTION IN RELATION TO MENTAL DISORDER.*

BY HUBERT J. NORMAN, M.B. EDIN.,

MEDICAL SUPERINTENDENT OF CAMBERWELL HOUSE; LECTURER IN MENTAL DISEASES AT WESTMINSTER HOSPITAL.

IT is difficult to discuss this subject without becoming controversial, for it is not yet so scientifically delimited as to be free from theory and hypothesis. According to some authorities, alcohol and drugs are actually responsible for quite a large proportion of cases of mental disorder, while to others these factors are incidental and enciting rather than causative. It will be admitted that alcohol and habit-forming drugs do have a very definite influence on nervous tissue, but whether this influence is invariably deleterious is disputed. At present, however, we are dealing with those cases in which deterioration has taken place. The dire effects upon the nervous system are but one aspect of the matter. Other parts of the economy are involved, so that the deterioration may be general. Speaking at the recent Anti-Alcoholic Congress at Antwerp, Sir Arthur Newsholme said that in his view the direct and indirect deaths caused by alcoholism are under-stated at 5 per cent. (11,000) among adult males in England. Tuberculosis, syphilis, and alcoholism are probably responsible for a majority of the total male deaths occurring between adolescence and old age, and alcohol is not the least deadly of the three enemies.

Fundamental Symptoms.

Broadly considered, the effects on the cerebral cortex are, as Dercum has pointed out, the same. "Each form of intoxication is distinguished by its own special features, though in its fundamental characters it resembles every other." The variations in symptomatology appear to depend more upon the quantity of the drug and the period of time over which it is taken than upon essential differences in their effects. The chief reason for taking these substances is in order to produce euphoria. The desire may be to chase away gloom and despondency or to heighten the feeling of well-being and of competence to undertake tasks for which the individual might otherwise consider himself incapable. Indeed, it is the feeling of inadequacy which so often lies behind the excesses; or, in more fashionable language, it is an "inferiority complex" which is responsible. Usually, therefore, it is the neuropathic or unstable individual who becomes an addict or, at least, who develops morbid mental symptoms.

An interesting point is the differences of susceptibility to the effects of alcohol and drugs, even in the same individual at different times or in different circumstances. Especially important is the lowered resistance brought about by head injuries.

There seems to be little doubt that the cortex is responsible for the system of inhibitions or checks upon which the social organisation depends. Interference with these may not be accompanied by any special danger if it does not go too far. Indeed, it may be of some utility where, for example, it allows the shy and diffident person to overcome his temperamental difficulties when necessity arises. The danger lies in too frequent recourse to this assistance. Since the feeling of inadequacy is often dependent upon constitutional defect, inherent or acquired, it is easy to understand how habit-formation may occur. The weakening of inhibition may, however, go to further stages and be demonstrated by changes of conduct such as extreme boastfulness, excessive irritability, and quarrelsomeness, and even outbreaks of maniacal fury. It is only necessary to recall such conditions as amok, Berserk rage, mania à potu, and the deeds of the tribe of assassins who took hashish. Doubtless these outbursts are allied to the epileptiform attacks—or to the actual epilepsy—which occur in association with some cases of chronic alcoholism. Impulsive suicidal acts also occur. Such overactions depend upon lower ranges of cells, which are allowed to function more or less unchecked. These, being more primitive and more stable, resist the toxic influences longer, but in due course more and more of them are interfered with or put out of action and other mental changes then ensue.

Intellectual Impairment.

With these changes there may be intellectual impairment of varying degree. Although there may be lucidity there may be, on the other hand, mental confusion even to the

* A lecture delivered before the Society for the Study of Inebriety on Oct. 9th.

stage of delirium, with disorientation and disordered movements. This is a familiar result of taking alcohol; but it may be produced by other drugs, for example, chloral and chlorodyne, cocaine and heroin. These results should be borne in mind when hypnotics and sedatives are being administered in order to procure sleep. If they are not given in sufficient quantities to inhibit the action of cells other than those of the cortex, there may be increased confusion and restlessness, as during the induction stage of anæsthesia.

Association of ideas, at first stimulated, is eventually slowed down as deterioration takes place. It may be suggested that the primary stimulation is shown more in the shape of excessive imagination, even of fantastic conceptions, than as actual intellectual output. As we have become accustomed to attach an undue value to works of imagination we are apt to lose sight of their lack of real intellectual content. In this connexion may be noted frequent illogicality—or at least wayward associations—exemplifying Mr. Dooley's dictum that though alcohol may be a good thing to talk on, it is a bad thing to think on! The intellectual deterioration shows itself in other ways. There is impairment of the moral sense, so that the victims develop into liars and will do or say anything to gain their ends. There is increased egotism. The patients are untidy and careless about personal cleanliness; they are unpunctual and unreliable. They may be acquisitive even to the point of thieving. It is well to remember the importance of this from the legal point of view. The possibility of sexual derelictions is also to be noted; latent impulses emerge unchecked.

Illusions, Hallucinations, and Memory Defects.

Illusions of sight and of the other senses may occur. Numbers of stories about drink and its effects have for their basis this tendency to misinterpret sensations. These illusions depend also upon impairment of association; wrong associations are formed often with ludicrous or grotesque effects. Hallucinations are most often of sight or of hearing, and may be transient or chronic, resembling paraphrenia. Delusions are formulated in some cases. As there is apt to be suspiciousness these may take a persecutory form or, not uncommonly, false beliefs of marital infidelity. As they are accompanied by weakening of self-control, they may lead to homicidal acts. The memory is also impaired. There is defect of fixation of new memories, and also retrograde amnesia. The combination of these leads to a paucity of ideas and consequently to a general mental restriction. Hence the wearisome iteration which is characteristic of the chronic alcoholic. As there may be, in addition, paramnesia, or "false" memory, where the hiatus in recollection is filled in with imaginary details, it is easy to understand how fabrication or romancing may occur. It is often difficult to decide how much this lying is due to paramnesia or how far it is wilful perversion of the truth.

There may be aboulia, or loss of will-power, so that the individual fails to carry through schemes which he may still have the power to formulate. He finds dreaming and scheming more easy than effort. As there may also be indifference and apathy the lack of executive ability does not worry him. On the other hand, he may be conscious of his defect yet unable to overcome it. Generally, however, in cases of long standing, there is real loss of insight and of appreciation of the defects of conduct which are no noticeable to the onlooker.

Special Symptom-complexes.

Special symptom-complexes are, of course, found in association with particular substances. As alcohol is the most readily obtained, cases of mental disorder associated with it are the most familiar. The most dramatic of these is, probably, delirium tremens. The polyneuritic psychosis (Korssakow's disease) is of great interest in demonstrating that other parts of the nervous system are implicated.[1] Dipsomania is a link with the psychoses which are not dependent ætiologically upon drugs, for it appears to be related to, or to be a variety of, manic-depressive insanity. Epileptiform attacks in association with alcohol demonstrate, may be, the alliance with idiopathic or true epilepsy. The occurrence of alcoholic paranoia and hallucinosis inevitably suggest a relationship with ordinary paranoia and with paraphrenia.[2] In some instances mental disorder is the primary trouble and the taking of alcohol is only incidental, and in this connexion may be noted manic-depressive insanity, general paralysis of the insane, epilepsy, and dementia præcox. Here we have a vicious circle, and without a doubt the alcohol tends to accelerate mental impairment. Where alcohol and other substances are taken the outbreak is still more grave.

It appears, therefore, that the taking of alcohol and other drugs, if persistent and excessive and linked, as it often is, with neuropathic defect, tends to bring the individual steadily towards the common ending of all chronic mental disorders—namely, mental impairment or even profound dementia. The minor degrees of this mental reduction may be overlooked for various reasons. For example, the chief deterioration may be in the "moral sense" and intelligence may appear unimpaired. Much greater latitude is usually allowed the individual in wickedness and depravity than in other directions. He may become a liar, or swindler, or a knave with less social reproval, maybe, than if he lets his clothes fall into disarray or forgets his table manners.

The nervous system has great potentiality for recovery even when it has been subjected for long periods to the influence of drugs. It is difficult to prophesy, even when the symptoms are very pronounced, what the results will be if the patient can be guarded against further excesses. This is, however, a very difficult matter. We are free agents in the matter of doping ourselves into a state of obfuscation, however much we may be hedged and guarded in other directions. For this reason the more stringent safeguards in the matter of dangerous drugs are very valuable. If the patient does submit to treatment in time or will refrain from further doping, recuperation may be rapid and extensive. On the other hand, cell-disintegration may have taken place, and will remain to that extent mentally crippled.

The Legal Aspect.

The matter is fairly simple when the symptoms are obvious; when there are, for example, definite aberrations of conduct, hallucinations, and delusions. But when the degree of disorder is not so marked it may be impossible to draw an arbitrary line between the "certifiables" and the "uncertifiables." It helps very little to invoke the doctrine of free-will and to say that the individuals should refrain from excess and that their disorder is their own fault. We know that a number of them are the victims of circumstances—of the "tyranny of their organisation"—and thus fated, literally and metaphorically, to fall by the wayside. It seems as if for them the only solution of the problem is prohibition. Yet a good many would come to grief anyhow, and we cannot remove all forms of temptation. However much we are dragooned and made to conform to regulations it is still true that "to step aside is human." Let us continue, therefore, to heed the admonition of one who had his own sad experience and "gently scan our brother man," rather than deal harshly or unsympathetically with him.

[1] It occurs also in association with other substances, but most commonly with alcohol.

[2] It will be noted that alcohol and drugs can produce the symptoms associated with various forms of insanity. If these symptoms persist the person may be certifiably insane.

HEALTH IN UGANDA.

In the report on Uganda for 1927, recently issued on the authority of the Colonial Office, it is stated that the activities of the Medical Department were further extended during the year. There were 480,516 new cases recorded as having attended the various Government hospitals, dispensaries, treatment centres, &c. This is an increase of 100,117 cases over the number recorded for 1926, and nearly six times the number treated in 1920. The total attendances at the various medical units numbered 2,038,448, as compared with 1,795,358 in 1926. The total number of cases admitted to wards was 21,562 and the aggregate number of in-patient days' treatment was 420,743. This gives an average daily number in wards of 1153 as against 970 in 1926. There were 3383 surgical operations performed in the year; 2127 were recorded for the previous year. Deaths in hospital showed a decrease of 286, the figures for 1927 being 1111 and for 1926 1397. This was largely accounted for by the falling off in the number of cases of dysentery during the year and the absence of a virulent epidemic form of this disease.

There are four Government European hospitals, nine Asiatic hospitals, 28 native hospitals, and 11 isolation hospitals in the Protectorate. These provide beds for 27 Europeans, 51 Asiatics, and 1391 natives. In addition there are 97 beds in isolation hospitals which may be used for either Asiatics or natives. Grants are made by Government towards the cost of medical training of both native attendants and midwives at mission hospitals and maternity training schools.

Native Vital Statistics.

Perhaps the most outstanding feature of the year from the medical point of view is the position revealed regarding the vital statistics of the general native population. The figures for the death-, birth-, and infantile mortality-rates, and the excess of births over deaths, are in all cases better than they have ever been. It would appear that they reflect the advantage which has accrued to the general native population as a result of the intensive development of the organisation for their treatment at hospitals, dispensaries, and maternity centres which has taken place during recent

years. The first report of an excess of births over deaths in Buganda occurred in 1924 and was represented by the modest figure of 37. It was conjectured that the absence of serious epidemics was a factor in the improvement then recorded. The excess of births over deaths now reported for the five districts rendering returns is 17,000 and indicates that the position is being consolidated and that a progressive increase in the native population can now be confidently predicted. Syphilis, malaria, yaws, and ulcers are the four most common diseases of the country, in the order shown. Pneumonia, dysentery, and injuries account for the largest number of deaths in hospital. Plague and sleeping sickness required more attention than usual during the year.

The League of Nations International Sleeping Sickness Commission which assembled at Entebbe early in 1926 ceased its labours and was dissolved on June 30th, 1927. The results of the Commission's work will be of the utmost importance to African administration as well as to science. Experiments and investigations in connexion with human and animal trypanosomiasis are being actively continued at Entebbe under the direction of Dr. H. L. Duke, O.B.E., who served as chairman of the Commission, which has now been dissolved. A research institute is to be set up at Entebbe for the study of human trypanosomiasis.

Population and Climate.

For all practical purposes the Protectorate may be said to cover an area of approximately 94,204 square miles, of which 15,017 square miles is water. The population on Dec. 31st, 1927, was estimated to be 3,149,354—viz., 1867 Europeans, 11,502 Asiatics, and 3,135,985 natives. The climate of the Protectorate as a whole, though pleasant, cannot be considered healthy for Europeans. European children as a rule thrive in infancy, but considerable risk is attached to bringing them out when they are over 2 or 3 years old, as they are liable to attacks of malaria and resultant anæmia. The health of adults depends mainly on their mode of life, and, with care, constitutional health should not be impaired, but, even if physical fitness is maintained, the altitude and proximity to the Equator combine to produce nervous strain after prolonged residence. Outdoor manual labour is dangerous for Europeans, and on plantations a manager's or owner's duties are for the most part supervisory. The mean maximum temperature for most districts averages 80° F. and the mean minimum 60° F. On the Ruwenzori Range there is extreme cold with perpetual snow, and it is also cold on the higher slopes of Mount Elgon. In the Nile Valley, near Lake Albert, on the other hand, the mean maximum temperature is 90° F. and the mean minimum 74° F. The favourite localities for European plantations are the Buganda Province, the Toro district of the Western Province, and the Bunyora district of the Northern Province. Statistics taken at Entebbe give the following results: average rainfall for the last 32 years, 59·62 in.; average temperature for the last 27 years, maximum 78·7° F., minimum 62·8° F.; mean daily sunshine for 1927, 6 hrs. 12 min. The rainfall at Entebbe for the year, which was below the average, amounted to 53·73 in., distributed over 124 days.

CONFERENCE ON MATERNAL MORTALITY.

A CONFERENCE called by the Maternal Mortality Committee formed in 1927 by the initiative of Miss Gertrude Tuckwell, J.P., was held at the Central Hall, Westminster, on Oct. 30th. Lady Galway, who presided, said that the problem of maternal mortality and morbidity appealed both to emotion and to reason. It was important to collect information from social and medical workers, but it was equally important that the information should be mercilessly sifted and examined if we were not to be side-tracked. Mr. Neville Chamberlain dealt with three criticisms which had been made against the Ministry of Health. He said that (1) the Ministry had not really cut down the milk supplied to welfare centres nor instructed local authorities to reduce it; but when a reduction in expenditure had been called for from his department he had been obliged to decide between cutting down the milk grant and interfering with the development of normal health services. He had especially excluded the distressed mining areas and every local authority which was spending less than £100 a year on milk; to the rest he had been compelled to say, "You must supply what milk you think desirable, but this is all I can give from national resources." (2) Strong representations had been put forward that the National Health Insurance Act should be altered to provide medical and midwifery service before and after childbirth. An effort had been made to devise a scheme within the resources of the approved societies: it could, however, only be carried out by pooling their funds, and some of the societies refused to do this. (3) Fear had been expressed that the new system of block grants would lead to reduced help to voluntary societies, especially those working for unmarried mothers and their children. Though in future these societies would be under the supervision of county and county borough councils, all grants would be considered by the Minister, who would naturally have regard to what had been given in the past. These points were warmly contested by subsequent speakers, great disappointment being expressed that Mr. Chamberlain had not been able to wait for the discussion. Dr. Marion Phillips said the cutting of the milk grant had had a discouraging effect on local authorities in respect of other services. The sum saved was a small one, and yet the authorities had been told that it was a choice between this small sum and expansion of health services. Mrs. Hubback pointed out that, by the block grant system, all the money would be paid by one cheque, no part of it being earmarked, and there was no guarantee that a proper proportion would be spent on maternity and child welfare or on health work at all. Such strong feeling was evident on the part of the conference that an additional resolution dealing with this point was put by Lady Galway and carried. A report covering the proposals made at the last conference was presented by Dr. Marion Phillips. Inquiries had shown that of the county authorities supplying the information asked for only 61 out of 116 carried out more than half their powers under the Maternity and Child Welfare Act. This was quite inadequate, and those who took their citizen duties seriously should do all in their power to rouse public opinion.

INSTRUCTIONS FOR PATIENTS.

THE busy practitioner might save himself much time if he had ready a series of printed slips to hand to his patients, explaining how to put on a fomentation, or douche the nose, or wash the eye, and so forth. Dr. T. T. B. Watson has hit on the idea of having such instructions printed on separate sheets with a perforated slip at the top which can be fixed in a "loose-leaf" holder. With each 25 of these sheets a folding cover is provided, bearing on the front the title, and inside in some cases remarks intended for the practitioner only. Having explained how a fomentation is to be done, the doctor reaches for his holder labelled "fomentations," and tears off a sheet to hand to the patient. In principle the idea can be both praised and criticised. It certainly is useful to be able to reinforce the spoken word with a printed memorandum, and as long as the subject-matter is confined to such examples as are mentioned above there is little room for differences of opinion. Other subjects treated in the set of eight "instructions" already issued are more open to individual opinions. The intensive "alkali" treatment of gastric and duodenal ulcer, diet in obesity, and exercises for constipation, are all matters upon which there is some diversity of opinion and much room for variation in individual cases. It is, however, open to the doctor to delete and alter such portions of the printed word as he sees fit. Dr. Watson's instructions should prove extremely useful so long as the doctor is watchful of the needs of individual patients, and supplements or modifies them with meticulous care. Messrs. H. K. Lewis and Co. publish the instructions at 25 for 1*s*.

"PROPYL."

Mr. W. H. Martindale sends us a bottle of "Propyl" which is a surgical antiseptic, composed of iodine in iso-propyl alcohol, as described by Dr. R. A. Macdonald and Mr. J. Wycliffe Peck in our issue of Sept. 1st last (p. 443). The preparation is supplied in a distinctive bottle, which has some serviceable features. The bottle stands firm, the aperture is semi-wide, making for quick pouring, and the stopper is of a sensible shape, excluding dust. Mr. Martindale tells us that five years ago he made a series of iso-propyl tinctures and spirits (described in the 19th edition of the Extra Pharmacopœia, Vol. I., pp. 122–125), which even now have no objectionable odours or vapours. This applies equally to the tincture of iodine (either strong or weak) made with iso-propyl instead of ethyl alcohol.

Corrigenda.—In a leading article entitled Cardiac Stimulants in our issue of Oct. 20th line 20 of col. 1, p. 825, should read "fall in blood pressure is *not* a result of cardiac failure."

Mr. L. J. Harris and Mr. T. Moore point out that the word "hypercalcæmia" was misprinted "hyperglycæmia" in the footnote to their letter on "Hypervitaminosis" and "Vitamin Balance," in our last issue (Oct. 27th, p. 893).

WE are informed that the address by Dr. Graham Little, to which we referred last week in an annotation on the Wisdom of Peter Harding, was delivered at the Royal Institute of Public Health and not at the Institute of Hygiene.